

## Transition Probabilities for the Dipole Allowed Fine Structure Transitions in SII

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### Abstract

The atomic quantities for bound-bound transitions such as the oscillator strengths, the line strengths, and the Einstein A-coefficients are obtained for a large number of dipole allowed ( $\Delta S = 0$ ) transitions for the astrophysically important ion SII. The oscillator strengths in *LS* coupling are obtained in an *ab initio* manner in the close coupling approximation using R-matrix method. The quantities for the fine structure transitions are obtained through an algebraic transformation of the *LS* values. The spectroscopic energies of the fine structure levels are used instead of the calculated energies to improve the accuracy of these values. Present calculations employs a 17-state eigenfunction expansion of the SIII core states. Results are presented for 1466 fine structure dipole allowed transitions in SII corresponding to 350 transitions in *LS* coupling. This work reports the first extensive tabulation of S II radiative transitions including fine structure. Comparison is made with the available experimental and theoretical data and good agreement is found with the observed values and other accurate theoretical works.

### 1. Introduction

S II is an astrophysically important ion [1], but like most other comparatively larger ions, theoretical studies for the radiative transition probabilities of this ion were carried out only in a small limited scale. However, accurate as well as extensive data are needed for the interpretation of observations being made, such as sulfur emission spectra of the plasma torus of Jupiter's satellite Io by Voyager I and II [2]. Furthermore, collisional rate coefficients have recently been computed for a large number of transitions in SII [3] and it is desirable to complement the atomic datasets for astrophysical modeling with radiative data.

The first extensive work on S II was carried out by Butler *et al.* [4] under the Opacity Project (OP) [5]. Like all OP calculations, their work was also carried out in *LS* coupling. But for laboratory plasma experiments and for a variety of astrophysical model applications, it is often the fine structure transitions that are required, rather than the *LS* values. The purpose of the present work is to provide a reasonably complete set of oscillator strengths (*f*-values), line strengths (*S*-values) and the transition rates (*A*-values) for the dipole allowed fine structure transitions in SII. The method has been applied to several other ions [6, 7], and is briefly summarized below.

### 2. Summary of the theoretical work and computations

The calculations for the atomic parameters of the fine structure transitions are based on obtaining the line strength, *S*, in an *ab initio* manner in the close coupling (CC) approximation. In the CC

approximation the core ion, termed as the "target", is represented by an N electron system. The wavefunction expansion,  $\Psi(E)$  for any symmetry,  $SL\pi$ , of the total (N + 1) electron system is represented in terms of the target states as:

$$\Psi(E) = A \sum_i \chi_i \theta_i + \sum_j c_j \Phi_j, \quad (1)$$

where  $\chi_i$  is the target ion wave function in a specific state  $S_i L_i \pi_i$  and  $\theta_i$  is the wave function for the (N + 1)th electron in a channel labeled as  $S_i L_i \pi_i k_i^2 l_i (SL\pi)$ ;  $k_i^2$  being its incident kinetic energy.  $\Phi_j$ 's are the correlation wavefunctions of the (N + 1) electron system that compensates the orthogonality condition of the total wavefunction. The CC sums imply extensive configuration interactions in the coupled wavefunctions for each  $SL\pi$ . Therefore, provided the relativistic effects are small, the *ab initio* computations for the derived transition matrix elements should be accurate.

The line strength,  $S$ , for transition between the initial "i" and the final "f" states is obtained as

$$S = |\langle \Psi_f \| D \| \Psi_i \rangle|^2, \quad (2)$$

where the operator  $D$  is

$$D = \sum_n r_n, \quad (3)$$

in length form, the sum going over total number of electrons in the ion, and  $\Psi_i, \Psi_f$  are the initial and final wavefunctions respectively. The line strength depend on the wave-functions, not on the energies, of these states. As we expect the present CC wavefunctions to be very accurate, it is possible to obtain improved oscillator strengths by using observed, rather than calculated, energy differences.

Using the energy difference,  $E_{fi}$ , of the initial and final states, the oscillator strength,  $f_{if}$ , for the transition can be obtained from  $S$  as

$$f_{if} = \frac{E_{fi}}{3g_i} S, \quad (4)$$

and the Einstein's A-coefficient,  $A_{fi}$ , as

$$A_{fi}(\text{a.u.}) = \frac{1}{2} \alpha^3 \frac{g_i}{g_f} E_{fi}^2 f_{if}, \quad (5)$$

where  $\alpha$  is the fine structure constant, and  $g_i, g_f$  are the statistical weight factors of the initial and final states, respectively. In terms of c.g.s. unit of time,

$$A_{fi}(\text{s}^{-1}) = \frac{A_{fi}(\text{a.u.})}{\tau_0}, \quad (6)$$

where  $\tau_0 = 2.4191 \times 10^{-17} \text{s}$  is the atomic unit of time. For the present work, the values of  $E_{fi}$  are used from the observed energies.

Table I. The 17 states of S III employed in the close coupling eigenfunction expansion of S II

$3s^23p^2$	$^3P^\circ$	$3s^23p^2$	$^1D^\circ$
$3s^23p^2$	$^1S^\circ$	$3s3p^3$	$^5S^\circ$
$3s3p^3$	$^3D^\circ$	$3s3p^3$	$^3P^\circ$
$3s3p^3$	$^1D^\circ$	$3s^23p3d$	$^3F^\circ$
$3s3p^3$	$^1P^\circ$	$3s3p^3$	$^3S^\circ$
$3s^23p3d$	$^3P^\circ$	$3s^23p4s$	$^3P^\circ$
$3s^23p3d$	$^3D^\circ$	$3s^23p4s$	$^1P^\circ$
$3s^23p3d$	$^1D^\circ$	$3s^23p3d$	$^1F^\circ$
$3s^23p3d$	$^1P^\circ$		

Spectroscopic configurations:  $3s^23p^2$ ,  $3s3p^3$ ,  $3s^23p3d$ ,  $3s^23p4s$

Correlation configurations:  $3s3p^23d$ ,  $3s^23d^2$ ,  $3p^4$ ,  $3p^33d$ ,  $3s3p3d^2$ ,  $3p^34s$

The fine structure line strengths,  $S_{JJ}$ , are obtained from the  $LS$  multiplet strength,  $S_{LS}$ , through the algebraic transformation as

$$S_{JJ} = C_{Al}(J_i, J_f) S_{LS} / [(2S_i + 1)(2L_i + 1)(2L_f + 1)], \quad (7)$$

for the allowed transitions ( $\Delta J = 0, \pm 1$ ).  $S$ , is the spin multiplicity which remains the same ( $S_i = S_f$ ) during the transitions. The values of the coefficients  $C_{Al}(J_i, J_f)$  are obtained from Allen [8]. The  $S_{JJ}$  values satisfy the condition

$$S_{LS} = \sum_J S_{JJ}. \quad (8)$$

The fine structure  $f$ -values,  $f_{JJ}$ , can also be obtained directly from the  $LS$  oscillator strengths,  $f_{LS}$ , as [9]

$$f_{JJ}(n_f S_i L_f J_f, n_i S_i L_i J_i) = f_{LS}(n_f S_i L_f, n_i S_i L_i) (2J_f + 1) \times (2L_i + 1) W^2(L_f L_i J_f J_i; 1S_i), \quad (9)$$

where  $W(L_f L_i J_f J_i; 1S_i)$  is a Racah coefficient. The above values also satisfy sum

$$\sum_{J_i J_f} (2J_i + 1) f_{JJ}(n_f S_i L_f J_f, n_i S_i L_i J_i) = (2S_i + 1)(2L_i + 1) f_{LS}(n_f S_i L_f, n_i S_i L_i). \quad (10)$$

Both algebraic transformations yield fine structure components with about the same accuracy. In the first case the fine structure splitting is carried out for the  $LS$  line strengths whereas in the latter case for the  $LS$   $f$ -values. The first transformation is more convenient to use when observed levels are available. The direct transformation of  $f$ -values is used

Table II. Absolute measured (expt) and calculated (calc) energies (in Rydberg unit) of *SiII*. The negative sign of the energies are not shown. The degeneracy of the states are assigned in ascending order for the even parity and descending order for the odd parity states belonging to the same symmetry. An asterisk next to a state indicates incomplete set of observed energy levels for the state.

Term		E (expt)	E (calc)	Term		E (expt)	E (calc)
3s <sup>2</sup> 3p <sup>3</sup>	z <sup>4</sup> S°	1.721	1.761	3s <sup>2</sup> 3p <sup>3</sup>	z <sup>2</sup> D°	1.585	1.610
3s <sup>2</sup> 3p <sup>3</sup>	z <sup>2</sup> P°	1.497	1.517	3s <sup>2</sup> 3p <sup>4</sup>	a <sup>4</sup> P°	0.995	1.034
3s3p <sup>4</sup>	a <sup>2</sup> D°	0.828	0.842	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	a <sup>2</sup> P°	0.757	0.773
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4s	b <sup>4</sup> P°	0.718	0.739	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	a <sup>4</sup> F°	0.714	0.727
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4s	b <sup>2</sup> P°	0.688	0.708	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	a <sup>4</sup> D°	0.680	0.696
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	a <sup>2</sup> F°	0.672	0.676	3s3p <sup>4</sup>	a <sup>2</sup> S°	0.629	0.632
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4s	b <sup>2</sup> D°	0.613	0.616	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	z <sup>2</sup> S°	0.577	0.574
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)3d	a <sup>2</sup> G°	0.562	0.542	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	z <sup>4</sup> D°	0.552	0.548
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	z <sup>4</sup> P°	0.536	0.533	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	c <sup>4</sup> P°	0.529	0.524
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	y <sup>2</sup> D°	0.527	0.522	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	y <sup>4</sup> S°	0.527	0.521
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4p	y <sup>2</sup> P°	0.505	0.499	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)3d	c <sup>2</sup> D°	0.503	0.495
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> S)4s	b <sup>2</sup> S°	0.478	0.477	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)3d	b <sup>2</sup> F°	0.458	0.445
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)3d	c <sup>2</sup> P°	0.445	0.425	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4p	z <sup>2</sup> F°	0.442	0.432
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4p	x <sup>2</sup> D°	0.438	0.429	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4p	x <sup>2</sup> P°	0.412	0.404
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)3d	d <sup>2</sup> D°	0.408	0.384	3s3p <sup>4</sup>	d <sup>2</sup> P°	0.394	0.375
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> S)3d	c <sup>2</sup> D°	0.364	0.330	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5s	d <sup>4</sup> P°	0.347	0.347
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5s	e <sup>2</sup> P°	0.338	0.338	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)3d	c <sup>2</sup> S°	0.339	0.320
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	b <sup>4</sup> F°	0.333	0.332	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	b <sup>4</sup> D°	0.324	0.324
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	e <sup>4</sup> P°	0.300	0.297	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	c <sup>2</sup> F°	0.296	0.292
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> S)4p	w <sup>2</sup> P°	0.297	0.290	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5p	y <sup>4</sup> D°	0.288	0.285
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5p	y <sup>4</sup> P°	0.282	0.281	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5p	x <sup>4</sup> S°	0.280	0.279
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5p	w <sup>2</sup> D°	0.276	0.273	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	f <sup>2</sup> P°	0.272	0.253
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)4d	f <sup>2</sup> D°	0.267	0.260	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)5s	g <sup>2</sup> D°	0.247	0.244
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4d	b <sup>2</sup> G°	0.224	0.220	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4d	d <sup>2</sup> F°	0.224	0.221
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)6s	f <sup>4</sup> P°	0.206	0.205	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4d	g <sup>2</sup> P°	0.206	0.200
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)6s	h <sup>2</sup> P°	0.202	0.201	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	c <sup>4</sup> F°	0.199	0.198
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	c <sup>4</sup> D°	0.195	0.195	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4d	h <sup>2</sup> D°	0.194	0.185
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	g <sup>4</sup> P°	0.187	0.185	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)5p	y <sup>2</sup> F°	0.186	0.182
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)4d	d <sup>2</sup> S°	0.180	0.174	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	e <sup>2</sup> F°	0.176	0.173
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	i <sup>2</sup> P°	0.177	0.169	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)5d	i <sup>2</sup> D°	0.172	0.170
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)7s	h <sup>4</sup> P°	0.137	0.136	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)7s	j <sup>2</sup> P°	0.134	0.133
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)6d	d <sup>4</sup> D°	0.132	0.130	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)6d	d <sup>4</sup> F°	0.130	0.132
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)6d	i <sup>4</sup> P°	0.126	0.126	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)6s	j <sup>2</sup> D°	0.107	0.104
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)5d	c <sup>2</sup> G°	0.097	0.095	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)7d	e <sup>4</sup> D°*	0.096	0.094
3s <sup>2</sup> 3p <sup>2</sup> ( <sup>3</sup> P)7d	j <sup>4</sup> P°	0.091	0.091	3s <sup>2</sup> 3p <sup>2</sup> ( <sup>1</sup> D)7s	k <sup>2</sup> D°	0.038	0.041

for the *LS* multiplets where a complete set of observed fine structure levels is unavailable for one or both the terms, and for transitions between high angular momentum states (transitions higher than  $H \leftrightarrow I$ ). Calculated energies are used for these cases.

The lifetime of a state can be obtained easily once the *A*-values of the state are known as

$$\tau_f = \frac{1}{A_f}, \quad (11)$$

where  $A_f$  is the total radiative transition probability for the state *f* i.e.,

$$A_f = \sum_i A_{fi}. \quad (12)$$

The present work on  $LS$  oscillator strengths for S II is carried out in a similar manner to the OP work [4], but employing a 17-state eigenfunction expansion which induces the 4s orbital (the OP expansion with 15-states does not include the 4s orbital); the relevant data for S III are given in Table I. The 17 states, dominated by configurations  $3s^23p^2$ ,  $3s3p^3$ ,  $3s^23p3d$ , and  $3s^23p4s$ , of the core ion S III, are optimized using the atomic structure code SUPERSTRUCTURE [10]. The theoretical details of the close coupling approximation using the R-matrix method are described in Ref. [5]. The computations are carried out using the R-matrix codes [11] as developed for the OP [5].

The number of radiative transitions in S II in the present work exceeds that of the previous OP calculations [4], and includes 316  $LS$  bound states below the first ionization threshold and 5002  $LS$  multiplets. A comparison is made of the present calculated energies with the observed ones in Table II. The observed  $LS$  energies are obtained through statistical average of the observed fine structure level energies. An asterisk next to a state in the table indicates incomplete set of observed energy levels for the state. The number of observed bound states of S II is smaller, 70  $LS$  terms in total [12], than the number of calculated bound states, 316. The calculated energies are within 5% difference of the 65 observed  $LS$  energies; the other 5 are within 10%.

For the fine structure transitions the algebraic transformations of the  $LS$  values are carried out as described above, with improved accuracy using spectroscopically observed energies, and employing the computer code JJTOOLS [7]. Results are obtained for transitions between only those  $LS$  states that have been observed, with either complete or incomplete set of observed fine structure levels. Each observed  $LS$  term has been designated by a degeneracy symbol, as shown in Table II, and is employed in representing the transitions in this work. This degeneracy assignment may not necessarily match the observed one; an ascending order of alphabets is chosen for the observed even parity states of a symmetry, while a descending order is chosen for the observed odd parity states.

### 3. Results and discussion

The  $f$ -,  $S$ , and  $A$ -values are obtained for a large number of fine structure transitions in S II. These results provide the first extensive set of fine structure transitions in S II. The earlier calculations are mainly for  $LS$  transitions and are limited to a small number of transitions except the work by Butler *et al.* [4].

In order to ascertain the accuracy of the present results, comparison is made with available theoretical and experimental values on S II in Table III. Present  $f$ -value for the transition  $3s^23p^3(z^2D^\circ) \rightarrow 3s^23p^24s(b^2D^\circ)$  agrees very well with the  $f$ -value obtained from the beam-foil experiment by Ryan *et al.* [14] in comparison to other calculations such as by Butler *et al.* [4] and Ojha and Hibbert [13]. Among the available theoretical calculations, the works of Butler *et al.* [4] and Ojha and Hibbert [13] are the most elaborate ones, the former using the R-matrix close coupling method and the latter from an optimised configuration-interaction type atomic structure calculation. For the other transition  $3s^23p^3(z^2P^\circ) \rightarrow 3s^23p^24s(b^2D^\circ)$  the present  $f$ -value is significantly lower than that by Ryan *et al.* [14]. This experimental  $f$ -value is much higher than the calculated value by Butler *et al.* [4] as well indicating a possible overestimation in the measured value. The  $f$ -value of both Butler *et al.* [4] and Ojha and Hibbert [13] agree very well with the measured value of Lawrence [15] in pulsed-beam experiment for the transition  $z^4S^\circ \rightarrow b^4P^\circ$ , whereas the present  $f$ -value is about 16% higher. This difference is reflected in the lifetime comparison as well, presented in the lower part of the table, for the fine structure components  $3s^23p^4(a^4P^\circ)_{5/2, 3/2, 1/2}$  of

the same multiplet obtained from the same measurement by Lawrence [15]. The calculated  $f$ -value by Cai and Pradhan [3] is lower than the measured value; their calculations were primarily intended for collisional data for SII and not particularly optimized for radiative quantities.

The present  $f$ -values are compared for a few more transitions with the other calculations, and all theoretical values are found to be in reasonable agreement with each other for the strong transitions. However, Ojha and Hibbert [13] obtain a higher value for the transition  $z^4S^o \rightarrow b^4P^e$  compared to the other calculations. For the relatively weak transition  $z^2P^o \rightarrow a^2S^e$  the present  $f$ -value agrees with Ojha and Hibbert, while for  $z^2P^o \rightarrow a^2D^e$  they agree better with

Table III. Comparison of the present  $f$ -values and lifetimes

Transition	Present	$f_{if}$ Expt.	Theo
$z^2D^o \rightarrow a^2D^e$	0.016		0.011 <sup>b</sup> , 0.011 <sup>c</sup> , 0.012 <sup>a</sup>
$z^2D^o \rightarrow b^2D^e$	0.146	0.14 (0.08) <sup>a</sup>	0.156 <sup>b</sup> , 0.151 <sup>c</sup>
$z^2D^o \rightarrow c^2D^e$	0.137		0.164 <sup>b</sup> , 0.145 <sup>c</sup> , 0.164 <sup>a</sup>
$z^2P^o \rightarrow a^2S^e$	0.008		0.006 <sup>b</sup> , 0.008 <sup>c</sup>
$z^2P^o \rightarrow a^2D^e$	0.0033		0.0011 <sup>b</sup> , 0.00096 <sup>c</sup> , 0.0018 <sup>a</sup>
$z^2P^o \rightarrow b^2D^e$	0.042	0.20 (0.12) <sup>a</sup>	0.061 <sup>b</sup>
$z^2P^o \rightarrow c^2D^e$	0.305		0.326 <sup>b</sup> , 0.323 <sup>c</sup>
$z^4S^o \rightarrow a^4P^e$	0.0377	0.032 (0.002) <sup>d</sup>	0.0310 <sup>b</sup> , 0.0329 <sup>c</sup> , 0.0286 <sup>a</sup>
$z^4S^o \rightarrow b^4P^e$	0.368		0.384 <sup>b</sup> , 0.420 <sup>c</sup> , 0.383 <sup>a</sup>
$z^4S^o \rightarrow c^4P^e$	2.39		2.43 <sup>b</sup> , 2.262 <sup>c</sup> , 2.246 <sup>a</sup>

  

State	Present	$\tau$ (ns) Expt.	Theo.
$a^4P^e$ 5/2	18.99	22.4 (2) <sup>d</sup>	
$a^4P^e$ 3/2	18.73	22.4 (2) <sup>d</sup>	
$a^4P^e$ 1/2	18.59	21.3 (2) <sup>d</sup>	

<sup>a</sup> Ryan *et al.* (1989).

<sup>b</sup> Butler *et al.* (OP).

<sup>c</sup> Ojha and Hibbert (1989).

<sup>d</sup> Lawrence (1969).

<sup>e</sup> Cai and Pradhan (1993).

the CC calculations of Butler *et al.*; the present  $f$ -value is higher than the other calculations.

The complete set of  $f$ -,  $S$ - and  $A$ -values for the dipole allowed fine structure transitions in S II obtained in the present work is presented in Table IV. The first line of each subset of data in the table corresponds to the  $LS$  transition, followed by the fine structure components. The degeneracy labels of the  $LS$  terms in the table correspond to those assigned in Table II for the energies. The energies of the initial and final levels in the fine structure set are given in unit of  $\text{cm}^{-1}$ , while the initial and the final  $LS$  states and the transitional energy differences are given in Rydberg units. The  $A$ -values are given in  $\text{s}^{-1}$ . An asterisk (\*) below an  $LS$  term in Table IV indicates an incomplete set of observed energy levels, and an asterisk for the energy corresponding to a transition indicates one or both of the levels missing from the set of observed energies. The table contains 1466 fine structure transitions corresponding to 350 in  $LS$  coupling.

The results obtained in the present work correspond to the 1466 fine structure transitions among the 70 observed  $LS$  bound states of S II. This is comparatively a small fraction of the total number of possible fine structure transitions that can be processed among 316 calculated  $LS$  bound states.

Based on accuracy of the calculated energies and comparison with other works, the

accuracy of the present  $f$ -,  $S$ - and  $A$ -values should be within 15-20% for most of the transitions. It should however be noted that the present method obtains the fine structure components through pure algebraic transformation and does not consider any relativistic mixing of  $LS$  terms explicitly in the wavefunctions. This may result in higher uncertainty for transitions between highly excited levels where LSJ-mixing is significant. In that case the intercombination line could be strong enough to reduce the strengths of some of the dipole allowed lines, or shift the strengths among some fine structure components.

#### 4. Conclusion

Radiative transition probabilities for a large number of transitions in S II are presented. Observed energies are used in the transformation of the  $LS$  coupled transition matrix elements to fine structure for improved accuracy. As there are only a few experimental oscillator strengths available, a comprehensive evaluation of the theoretical data is difficult; however there is good agreement with previous accurate theoretical calculations. The overall uncertainty due to relativistic effects for the dipole transitions should be small. However the transitions among highly excited levels may have higher uncertainty due to neglected mixing effects. Present results should provide a reasonably complete set of data for a large number of fine structure transitions in SII.

The entire table of transition probabilities and energies, Table IV, is available in electronic form from the author at: [nahar@seaton.mps.ohio-state.edu](mailto:nahar@seaton.mps.ohio-state.edu), (a FORTRAN77 code is attached to the table to read the  $A$ -values and calculate the lifetimes).

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#### References

1. Osterbrock, D. E., "Astrophysics of Gaseous Nebulae and Active Galactic Nuclei" (University Science Books, Mill Valley, CA 1989).
2. Moos, W. *et al*, *Astrophys. J.* **382**, L105 (1991).
3. Wei Cai and Pradhan, A. K., *Astrophys. J. Suppl.* **88**, 329 (1993).
4. Butler, K., Mendoza, C. and Zeippen, C.J., (to be published); data is. presently stored in the Opacity Project database, TOPbase, at CDS.
5. Seaton, M. J., *J. Phys.* **B20**, 6363 (1987).
6. Nahar, S. N., *Physica Scripta* **48**, 297 (1993).
7. Nahar, S. N., *Astron. Astrophys.* **293**, 6363 (1995).
8. Allen, C. W., "Astrophysical Quantities" (3rd Edition) (Athlone Press, London 1976).
9. Seaton, M. J., Yu, Y., Mihalas, D. and Pradhan, A. K., *Mon. Not. R. Astron. Soc.* **266**, 805 (1994).
10. Eissner, W., Jones, M. and Nussbaumer, H., *Comput. Phys. Commun.* **8**, 270 (1974).
11. Berrington, K. A. *et al*, *J. Phys.* **B20**, 6379 (1987).
12. Martin, W. C, Zalubas, R., and Musgrove, A., *J. Phys. Chem. Ref. Data* **19**, 821 (1990); Kaufman, V. and Martin, W. C, *J. Phys. Chem. Ref. Data* **22**, 279 (1993).

13. Ojha, P. C. and Hibbert, A., J. Phys. **B22**,1153 (1989).
14. Ryan, L. J., Rayburn, L. A. and Cunningham, A. J., J. Quant. Spectro-sc. Radiat. Transfer **42**, 295 (1989).
15. Lawrence, G. M., Phys. Rev. **179**,134 (1969).



Table IV. The  $f$ -,  $S$ - and  $A$ -values for transitions in  $SiII$ 

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ $\text{Ry}$	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^4S^{\circ} \rightarrow a^4P^{\circ}$	1.7207	0.9952	7.255E-01	4	12	3.768E-02	6.232E-01	5.309E+07
	0.000	79 395.390	7.235E-01	4	6	1.879E-02	3.116E-01	5.266E+07
	0.000	79 756.830	7.268E-01	4	4	1.258E-02	2.077E-01	5.338E+07
	0.000	79 962.610	7.287E-01	4	2	6.307E-03	1.039E-01	5.380E+07
$z^4S^{\circ} \rightarrow b^4P^{\circ}$	1.7207	0.7183	1.002E+00	4	12	3.677E-01	4.402E+00	9.893E+08
	0.000	110 268.600	1.005E+00	4	6	1.843E-01	2.201E+00	9.963E+08
	0.000	109 831.590	1.001E+00	4	4	1.224E-01	1.467E+00	9.848E+08
	0.000	109 560.690	9.984E-01	4	2	6.104E-02	7.336E-01	9.774E+08
$z^4S^{\circ} \rightarrow c^4P^{\circ}$	1.7207	0.5294	1.191E+00	4	12	2.392E+00	2.409E+01	9.088E+09
	0.000	130 602.210	1.190E+00	4	6	1.195E+00	1.205E+01	9.060E+09
	0.000	130 818.850	1.192E+00	4	4	7.977E-01	8.030E+00	9.106E+09
	0.000	130 948.940	1.193E+00	4	2	3.993E-01	4.015E+00	9.133E+09
$z^4S^{\circ} \rightarrow d^4P^{\circ}$	1.7207	0.3473	1.373E+00	4	12	4.469E-02	3.905E-01	2.257E+08
	0.000	150 996.410	1.376E+00	4	6	2.239E-02	1.952E-01	2.270E+08
	0.000	150 531.310	1.372E+00	4	4	1.488E-02	1.302E-01	2.249E+08
	0.000	150 258.510	1.369E+00	4	2	7.426E-03	6.508E-02	2.237E+08
$z^4S^{\circ} \rightarrow e^4P^{\circ}$	1.7207	0.2996	1.421E+00	4	12	5.048E-01	4.262E+00	2.729E+09
	0.000	155 818.710	1.420E+00	4	6	2.522E-01	2.131E+00	2.722E+09
	0.000	156 029.540	1.422E+00	4	4	1.683E-01	1.421E+00	2.733E+09
	0.000	156 148.480	1.423E+00	4	2	8.423E-02	7.104E-01	2.740E+09
$z^4S^{\circ} \rightarrow f^4P^{\circ}$	1.7207	0.2063	1.514E+00	4	12	1.435E-02	1.137E-01	8.814E+07
	0.000	166 479.820	1.517E+00	4	6	7.190E-03	5.687E-02	8.861E+07
	0.000	165 991.350	1.513E+00	4	4	4.779E-03	3.791E-02	8.782E+07
	0.000	165 719.230	1.510E+00	4	2	2.386E-03	1.896E-02	8.739E+07
$z^4S^{\circ} \rightarrow g^4P^{\circ}$	1.7207	0.1868	1.534E+00	4	12	1.613E-01	1.262E+00	1.016E+09
	0.000	168 217.100	1.533E+00	4	6	8.061E-02	6.311E-01	1.014E+09
	0.000	168 397.890	1.535E+00	4	4	5.380E-02	4.207E-01	1.018E+09
	0.000	168 490.430	1.535E+00	4	2	2.692E-02	2.104E-01	1.019E+09
$z^4S^{\circ} \rightarrow h^4P^{\circ}$	1.7207	0.1369	1.584E+00	4	12	6.870E-03	5.205E-02	4.614E+07
	0.000	174 098.100	1.587E+00	4	6	3.441E-03	2.603E-02	4.638E+07
	0.000	173 595.770	1.582E+00	4	4	2.287E-03	1.735E-02	4.597E+07
	0.000	173 316.830	1.579E+00	4	2	1.142E-03	8.675E-03	4.576E+07
$z^4S^{\circ} \rightarrow i^4P^{\circ}$	1.7207	0.1263	1.594E+00	4	12	7.119E-02	5.358E-01	4.845E+08
	0.000	174 892.750	1.594E+00	4	6	3.558E-02	2.679E-01	4.839E+08
	0.000	175 019.780	1.595E+00	4	4	2.374E-02	1.786E-01	4.850E+08
	0.000	175 083.510	1.596E+00	4	2	1.187E-02	8.930E-02	4.855E+08
$z^4S^{\circ} \rightarrow j^4P^{\circ}$	1.7207	0.0905	1.630E+00	4	12	3.734E-02	2.749E-01	2.657E+08
	0.000	178 848.960	1.630E+00	4	6	1.867E-02	1.374E-01	2.655E+08
	0.000	178 915.200	1.630E+00	4	4	1.245E-02	9.162E-02	2.658E+08
	0.000	178 969.320	1.631E+00	4	2	6.226E-03	4.581E-02	2.660E+08
$y^4S^{\circ} \rightarrow d^4P^{\circ}$	0.5267	0.3473	1.794E-01	4	12	3.311E-01	2.215E+01	2.854E+07
	131 028.850	150 996.410	1.820E-01	4	6	1.679E-01	1.107E+01	2.979E+07
	131 028.850	150 531.310	1.777E-01	4	4	1.093E-01	7.382E+00	2.773E+07
	131 028.850	150 258.510	1.753E-01	4	2	5.392E-02	3.691E+00	2.662E+07
$y^4S^{\circ} \rightarrow e^4P^{\circ}$	0.5267	0.2996	2.270E-01	4	12	7.840E-01	4.144E+01	1.082E+08
	131 028.850	155 818.710	2.259E-01	4	6	3.900E-01	2.072E+01	1.066E+08
	131 028.850	156 029.540	2.278E-01	4	4	2.622E-01	1.381E+01	1.093E+08
	131 028.850	156 148.480	2.289E-01	4	2	1.317E-01	6.907E+00	1.109E+08

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^4S^\circ \rightarrow f^4P^\circ$	0.5267	0.2063	3.204E-01	4	12	2.612E-02	9.782E-01	7.179E+06
	131 028.850	166 479.820	3.231E-01	4	6	1.317E-02	4.891E-01	7.361E+06
	131 028.850	165 991.350	3.186E-01	4	4	8.657E-03	3.261E-1	7.058E+06
	131 028.850	165 719.230	3.161E-01	4	2	4.294E-03	1.630E-01	6.893E+06
$y^4S^\circ \rightarrow g^4P^\circ$	0.5267	0.1868	3.398E-01	4	12	1.099E-01	3.880E+00	3.398E+07
	131 028.850	168 217.100	3.389E-01	4	6	5.478E-02	1.940E+00	3.369E+07
	131 028.850	168 397.890	3.406E-01	4	4	3.671E-02	1.293E+00	3.420E+07
	131 028.850	168 490.430	3.414E-01	4	2	1.840E-02	6.466E-01	3.444E+07
$y^4S^\circ \rightarrow h^4P^\circ$	0.5267	0.1369	3.898E-01	4	12	7.897E-03	2.431E-01	3.212E+06
	131 028.850	174 098.100	3.925E-01	4	6	3.976E-03	1.216E-01	3.280E+06
	131 028.850	173 595.770	3.879E-01	4	4	2.620E-03	8.104E-02	3.166E+06
	131 028.850	173 316.830	3.854E-01	4	2	1.301E-03	4.052E-02	3.105E+06
$y^4S^\circ \rightarrow i^4P^\circ$	0.5267	0.1263	4.004E-01	4	12	3.424E-02	1.026E+00	1.470E+07
	131 028.850	174 892.750	3.997E-01	4	6	1.709E-02	5.130E-01	1.462E+07
	131 028.850	175 019.780	4.009E-01	4	4	1.143E-02	3.420E-01	1.475E+07
	131 028.850	175 083.510	4.015E-01	4	2	5.722E-03	1.710E-01	1.482E+07
$y^4S^\circ \rightarrow j^4P^\circ$	0.5267	0.0905	4.362E-01	4	12	1.510E-02	4.155E-01	7.692E+06
	131 028.850	178 848.960	4.358E-01	4	6	7.545E-03	2.078E-01	7.673E+06
	131 028.850	178 915.200	4.364E-01	4	4	5.037E-03	1.385E-01	7.705E+06
	131 028.850	178 969.320	4.369E-01	4	2	2.521E-03	6.925E-02	7.731E+06
$x^4S^\circ \rightarrow f^4P^\circ$	0.2798	0.2063	7.355E-02	4	12	3.921E-01	6.397E+01	5.679E+06
	158 118.750	166 479.820	7.620E-02	4	6	2.031E-01	3.198E+01	6.315E+06
	158 118.750	165 991.350	7.170E-02	4	4	1.274E-01	2.132E+01	5.261E+06
	158 118.750	165 719.230	6.920E-02	4	2	6.148E-02	1.066E+01	4.729E+06
$x^4S^\circ \rightarrow g^4P^\circ$	0.2798	0.1868	9.299E-02	4	12	9.294E-01	1.199E+02	2.152E+07
	158 118.750	168 217.100	9.200E-02	4	6	4.598E-01	5.997E+01	2.084E+07
	158 118.750	168 397.890	9.370E-02	4	4	3.122E-01	3.998E+01	2.201E+07
	158 118.750	168 490.430	9.450E-02	4	2	1.574E-01	1.999E+01	2.258E+07
$x^4S^\circ \rightarrow h^4P^\circ$	0.2798	0.1369	1.429E-01	4	12	4.042E-02	3.394E+00	2.210E+06
	158 118.750	174 098.100	1.456E-01	4	6	2.059E-02	1.697E+00	2.337E+06
	158 118.750	173 595.770	1.410E-01	4	4	1.329E-02	1.131E+00	2.123E+06
	158 118.750	173 316.830	1.385E-01	4	2	6.528E-03	5.656E-01	2.012E+06
$x^4S^\circ \rightarrow i^4P^\circ$	0.2798	0.1263	1.535E-01	4	12	1.634E-01	1.277E+01	1.031E+07
	158 118.750	174 892.750	1.528E-01	4	6	8.132E-02	6.387E+00	1.017E+07
	158 118.750	175 019.780	1.540E-01	4	4	5.464E-02	4.258E+00	1.041E+07
	158 118.750	175 083.510	1.546E-01	4	2	2.743E-02	2.129E+00	1.053E+07
$x^4S^\circ \rightarrow j^4P^\circ$	0.2798	0.0905	1.893E-01	4	12	6.073E-02	3.850E+00	5.826E+06
	158 118.750	178 848.960	1.889E-01	4	6	3.030E-02	1.925E+00	5.790E+06
	158 118.750	178 915.200	1.895E-01	4	4	2.027E-02	1.283E+00	5.845E+06
	158 118.750	178 969.320	1.900E-01	4	2	1.016E-02	6.416E-01	5.892E+06
$a^4P^\circ \rightarrow y^4S^\circ$	0.9952	0.5267	4.686E-01	12	4	1.225E-02	9.408E-01	6.478E+07
	79 395.390	131 028.850	4.705E-01	6	4	1.230E-02	4.704E-01	3.279E+07
	79 756.830	131 028.850	4.672E-01	4	4	1.221E-02	3.136E-01	2.141E+07
	79 962.610	131 028.850	4.653E-01	2	4	1.216E-02	1.568E-01	1.058E+07
$a^4P^\circ \rightarrow x^4S^\circ$	0.9952	0.2798	7.154E-01	12	4	9.552E-03	4.807E-01	1.178E+08
	79 395.390	158 118.750	7.174E-01	6	4	9.578E-03	2.403E-01	5.939E+07
	79 756.830	158 118.750	7.141E-01	4	4	9.534E-03	1.602E-01	3.905E+07
	79 962.610	158 118.750	7.122E-01	2	4	9.509E-03	8.011E-02	1.937E+07

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
<b>a <sup>4</sup>P° → z <sup>4</sup>P°</b>	0.9952	0.5362	4.590E-01	12	12	1.556E-02	1.221E+00	2.634E+07
	79 395.390	130 134.160	4.624E-01	6	6	1.097E-02	4.272E-01	1.885E+07
	79 395.390	129 858.180	4.599E-01	6	4	4.678E-03	1.831E-01	1.192E+07
	79 756.830	130 134.160	4.591E-01	4	6	7.005E-03	1.831E-01	7.906E+06
	79 756.830	129 858.180	4.566E-01	4	4	2.064E-03	5.425E-02	3.457E+06
	79 756.830	129 787.830	4.559E-01	4	2	6.441E-03	1.695E-01	2.150E+07
	79 962.610	129 858.180	4.547E-01	2	4	1.285E-02	1.695E-01	1.067E+07
	79 962.610	129 787.830	4.540E-01	2	2	2.566E-03	3.391E-02	4.248E+06
<b>a <sup>4</sup>P° → y <sup>4</sup>P°</b>	0.9952	0.2825	7.127E-01	12	12	3.626E-03	1.831E-01	1.480E+07
	79 395.390	158 038.600	7.167E-01	6	6	2.552E-03	6.410E-02	1.053E+07
	79 395.390	157 579.680	7.125E-01	6	4	1.087E-03	2.747E-02	6.651E+06
	79 756.830	158 038.600	7.134E-01	4	6	1.633E-03	2.747E-02	4.451E+06
	79 756.830	157 579.680	7.092E-01	4	4	4.811E-04	8.140E-03	1.943E+06
	79 756.830	157 677.320	7.101E-01	4	2	1.505E-03	2.544E-02	1.219E+07
	79 962.610	157 579.680	7.073E-01	2	4	2.999E-03	2.544E-02	6.025E+06
	79 962.610	157 677.320	7.082E-01	2	2	6.005E-04	5.087E-03	2.419E+06
<b>a <sup>4</sup>P° → z <sup>4</sup>D°</b>	0.9952	0.5517	4.436E-01	12	20	4.526E-05	3.674E-03	4.292E+04
	79 395.390	128 599.160	4.484E-01	6	8	3.661E-05	1.469E-03	4.434E+04
	79 395.390	128 233.200	4.450E-01	6	6	8.174E-06	3.306E-04	1.300E+04
	79 395.390	127 976.340	4.427E-01	6	4	9.035E-07	3.674E-05	2.133E+03
	79 756.830	128 233.200	4.417E-01	4	6	2.840E-05	7.714E-04	2.967E+04
	79 756.830	127 976.340	4.394E-01	4	4	1.435E-05	3.918E-04	2.225E+04
	79 756.830	127 825.080	4.380E-01	4	2	2.235E-06	6.123E-05	6.887E+03
	79 962.610	127 976.340	4.375E-01	2	4	2.232E-05	3.061E-04	1.716E+04
	79 962.610	127 825.080	4.361E-01	2	2	2.225E-05	3.061E-04	3.400E+04
<b>a <sup>4</sup>P° → y <sup>4</sup>D°</b>	0.9952	0.2878	7.075E-01	12	20	5.889E-04	2.997E-02	1.421E+06
	79 395.390	157 558.770	7.123E-01	6	8	4.744E-04	1.199E-02	1.450E+06
	79 395.390	157 173.690	7.088E-01	6	6	1.062E-04	2.697E-03	4.286E+05
	79 395.390	156 939.500	7.066E-01	6	4	1.176E-05	2.997E-04	7.077E+04
	79 756.830	157 173.690	7.055E-01	4	6	3.700E-04	6.293E-03	9.861E+05
	79 756.830	156 939.500	7.033E-01	4	4	1.873E-04	3.197E-03	7.443E+05
	79 756.830	156 829.750	7.023E-01	4	2	2.923E-05	4.995E-04	2.316E+05
	79 962.610	156 939.500	7.014E-01	2	4	2.919E-04	2.497E-03	5.769E+05
	79 962.610	156 829.750	7.004E-01	2	2	2.915E-04	2.497E-03	1.149E+06
<b>b <sup>4</sup>P° → y <sup>4</sup>S°</b>	0.7183	0.5267	1.916E-01	12	4	1.384E-01	2.601E+01	1.224E+08
	110 268.600	131 028.850	1.892E-01	6	4	1.367E-01	1.300E+01	5.895E+07
	109 831.590	131 028.850	1.931E-01	4	4	1.395E-01	8.670E+00	4.178E+07
	109 560.690	131 028.850	1.956E-01	2	4	1.413E-01	4.335E+00	2.172E+07
<b>b <sup>4</sup>P° → x <sup>4</sup>S°</b>	0.7183	0.2798	4.384E-01	12	4	1.534E-03	1.259E-01	7.104E+06
	110 268.600	158 118.750	4.361E-01	6	4	1.525E-03	6.296E-02	3.495E+06
	109 831.590	158 118.750	4.400E-01	4	4	1.539E-03	4.197E-02	2.393E+06
	109 560.690	158 118.750	4.425E-01	2	4	1.548E-03	2.099E-02	1.217E+06
<b>b <sup>4</sup>P° → z <sup>4</sup>P°</b>	0.7183	0.5362	1.821E-01	12	12	3.255E-01	6.437E+01	8.668E+07
	110 268.600	130 134.160	1.811E-01	6	6	2.267E-01	2.253E+01	5.971E+07
	110 268.600	129 858.180	1.786E-01	6	4	9.580E-02	9.655E+00	3.682E+07
	109 831.590	130 134.160	1.850E-01	4	6	1.489E-01	9.655E+00	2.728E+07
	109 831.590	129 858.180	1.825E-01	4	4	4.351E-02	2.861E+00	1.164E+07
	109 831.590	129 787.830	1.818E-01	4	2	1.354E-01	8.940E+00	7.191E+07
	109 560.690	129 858.180	1.850E-01	2	4	2.757E-01	8.940E+00	3.789E+07
	109 560.690	129 787.830	1.843E-01	2	2	5.492E-02	1.788E+00	1.499E+07
<b>b <sup>4</sup>P° → y <sup>4</sup>P°</b>	0.7183	0.2825	4.358E-01	12	12	1.577E-03	1.303E-01	2.406E+06
	110 268.600	158 038.600	4.354E-01	6	6	1.103E-03	4.561E-02	1.680E+06
	110 268.600	157 579.680	4.312E-01	6	4	4.683E-04	1.955E-02	1.049E+06
	109 831.590	158 038.600	4.393E-01	4	6	7.156E-04	1.955E-02	7.395E+05
	109 831.590	157 579.680	4.351E-01	4	4	2.100E-04	5.792E-03	3.193E+05
	109 831.590	157 677.320	4.360E-01	4	2	6.576E-04	1.810E-02	2.008E+06
	109 560.690	157 579.680	4.376E-01	2	4	1.320E-03	1.810E-02	1.015E+06
	109 560.690	157 677.320	4.385E-01	2	2	2.646E-04	3.620E-03	4.086E+05

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
<b>b<sup>4</sup>P<sup>o</sup>→z<sup>4</sup>D<sup>o</sup></b>	0.7183	0.5517	1.666E-01	12	20	5.429E-01	1.173E+02	7.263E+07
	110 268.600	128 599.160	1.671E-01	6	8	4.357E-01	4.693E+01	7.328E+07
	110 268.600	128 233.200	1.637E-01	6	6	9.603E-02	1.056E+01	2.067E+07
	110 268.600	127 976.340	1.614E-01	6	4	1.052E-02	1.173E+00	3.302E+06
	109 831.590	128 233.200	1.676E-01	4	6	3.441E-01	2.464E+01	5.176E+07
	109 831.590	127 976.340	1.653E-01	4	4	1.724E-01	1.251E+01	3.783E+07
	109 831.590	127 825.080	1.639E-01	4	2	2.671E-02	1.955E+00	1.153E+07
	109 560.690	127 976.340	1.678E-01	2	4	2.734E-01	9.777E+00	3.092E+07
	109 560.690	127 825.080	1.664E-01	2	2	2.712E-01	9.777E+00	6.031E+07
<b>b<sup>4</sup>P<sup>o</sup>→y<sup>4</sup>D<sup>o</sup></b>	0.7183	0.2878	4.305E-01	12	20	3.474E-04	2.905E-02	3.102E+05
	110 268.600	157 558.770	4.310E-01	6	8	2.782E-04	1.162E-02	3.113E+05
	110 268.600	157 173.690	4.275E-01	6	6	6.209E-05	2.614E-03	9.114E+04
	110 268.600	156 939.500	4.253E-01	6	4	6.863E-06	2.905E-04	1.496E+04
	109 831.590	157 173.690	4.314E-01	4	6	2.193E-04	6.100E-03	2.185E+05
	109 831.590	156 939.500	4.292E-01	4	4	1.108E-04	3.098E-03	1.640E+05
	109 831.590	156 829.750	4.282E-01	4	2	1.727E-05	4.841E-04	5.088E+04
	109 560.690	156 939.500	4.317E-01	2	4	1.742E-04	2.421E-03	1.304E+05
	109 560.690	156 829.750	4.307E-01	2	2	1.738E-04	2.421E-03	2.589E+05
<b>c<sup>4</sup>P<sup>o</sup>→y<sup>4</sup>S<sup>o</sup></b>	0.5294	0.5267	2.703E-03	12	4	2.137E-03	2.846E+01	3.763E+02
	130 602.210	131 028.850	3.900E-03	6	4	3.083E-03	1.423E+01	5.650E+02
	130 818.850	131 028.850	1.900E-03	4	4	1.502E-03	9.486E+00	4.355E+01
	130 948.940	131 028.850	7.000E-04	2	4	5.534E-04	4.743E+00	1.089E+00
<b>c<sup>4</sup>P<sup>o</sup>→x<sup>4</sup>S<sup>o</sup></b>	0.5294	0.2798	2.496E-01	12	4	4.634E-03	6.684E-01	6.954E+06
	130 602.210	158 118.750	2.508E-01	6	4	4.657E-03	3.342E-01	3.529E+06
	130 818.850	158 118.750	2.488E-01	4	4	4.620E-03	2.228E-01	2.297E+06
	130 948.940	158 118.750	2.476E-01	2	4	4.597E-03	1.114E-01	1.132E+06
<b>c<sup>4</sup>P<sup>o</sup>→y<sup>4</sup>P<sup>o</sup></b>	0.5294	0.2825	2.469E-01	12	12	5.359E-03	7.814E-01	2.624E+06
	130 602.210	158 038.600	2.501E-01	6	6	3.800E-03	2.735E-01	1.909E+06
	130 602.210	157 579.680	2.459E-01	6	4	1.601E-03	1.172E-01	1.167E+06
	130 818.850	158 038.600	2.481E-01	4	6	2.423E-03	1.172E-01	7.987E+05
	130 818.850	157 579.680	2.439E-01	4	4	7.058E-04	3.473E-02	3.373E+05
	130 818.850	157 677.320	2.448E-01	4	2	2.214E-03	1.085E-01	2.131E+06
	130 948.940	157 579.680	2.427E-01	2	4	4.390E-03	1.085E-01	1.038E+06
	130 948.940	157 677.320	2.436E-01	2	2	8.812E-04	2.171E-02	4.200E+05
<b>c<sup>4</sup>P<sup>o</sup>→y<sup>4</sup>D<sup>o</sup></b>	0.5294	0.2878	2.416E-01	12	20	2.829E-03	4.216E-01	7.961E+05
	130 602.210	157 558.770	2.457E-01	6	8	2.302E-03	1.686E-01	8.371E+05
	130 602.210	157 173.690	2.422E-01	6	6	5.105E-04	3.794E-02	2.406E+05
	130 602.210	156 939.500	2.400E-01	6	4	5.621E-05	4.216E-03	3.901E+04
	130 818.850	157 173.690	2.402E-01	4	6	1.772E-03	8.853E-02	5.475E+05
	130 818.850	156 939.500	2.380E-01	4	4	8.919E-04	4.497E-02	4.058E+05
	130 818.850	156 829.750	2.370E-01	4	2	1.388E-04	7.026E-03	1.252E+05
	130 948.940	156 939.500	2.368E-01	2	4	1.387E-03	3.513E-02	3.122E+05
	130 948.940	156 829.750	2.358E-01	2	2	1.381E-03	3.513E-02	6.166E+05
<b>d<sup>4</sup>P<sup>o</sup>→x<sup>4</sup>S<sup>o</sup></b>	0.3473	0.2798	6.744E-02	12	4	2.029E-01	1.083E+02	2.224E+07
	150 996.410	158 118.750	6.490E-02	6	4	1.953E-01	5.417E+01	9.911E+06
	150 531.310	158 118.750	6.920E-02	4	4	2.082E-01	3.611E+01	8.010E+06
	150 258.510	158 118.750	7.160E-02	2	4	2.155E-01	1.806E+01	4.436E+06
<b>d<sup>4</sup>P<sup>o</sup>→y<sup>4</sup>P<sup>o</sup></b>	0.3473	0.2825	6.476E-02	12	12	5.009E-01	2.784E+02	1.687E+07
	150 996.410	158 038.600	6.420E-02	6	6	3.475E-01	9.744E+01	1.151E+07
	150 996.410	157 579.680	6.000E-02	6	4	1.392E-01	4.176E+01	6.038E+06
	150 531.310	158 038.600	6.850E-02	4	6	2.384E-01	4.176E+01	5.990E+06
	150 531.310	157 579.680	6.430E-02	4	4	6.630E-02	1.237E+01	2.202E+06
	150 531.310	157 677.320	6.520E-02	4	2	2.101E-01	3.867E+01	1.435E+07
	150 258.510	157 579.680	6.670E-02	2	4	4.299E-01	3.867E+01	7.680E+06
	150 258.510	157 677.320	6.760E-02	2	2	8.713E-02	7.734E+00	3.198E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$d^4P^o \rightarrow y^4D^o$	0.3473	0.2878	5.949E-02	12	20	8.396E-01	5.081E+02	1.432E+07
	150 996.410	157 558.770	5.980E-02	6	8	6.752E-01	2.032E+02	1.454E+07
	150 996.410	157 173.690	5.630E-02	6	6	1.430E-01	4.573E+01	3.641E+06
	150 996.410	156 939.500	5.410E-02	6	4	1.527E-02	5.081E+00	5.385E+05
	150 531.310	157 173.690	6.060E-02	4	6	5.388E-01	1.067E+02	1.060E+07
	150 531.310	156 939.500	5.840E-02	4	4	2.637E-01	5.419E+01	7.225E+06
	150 531.310	156 829.750	5.740E-02	4	2	4.050E-02	8.468E+00	2.144E+06
	150 258.510	156 939.500	6.080E+02	2	4	4.290E-01	4.234E+01	6.369E+06
	150 258.510	156 829.750	5.980E-02	2	2	4.220E-01	4.234E+01	1.212E+07
$c^4P^o \rightarrow x^4S^o$	0.2996	0.2798	1.982E-02	12	4	7.820E-02	1.420E+02	7.401E+05
	155 818.710	158 118.750	2.100E-02	6	4	8.286E-02	7.102E+01	4.403E+05
	156 029.540	158 118.750	1.910E-02	4	4	7.536E-02	4.735E+01	2.208E+05
	156 148.480	158 118.750	1.800E-02	2	4	7.102E-02	2.367E+01	9.242E+04
$c^4P^o \rightarrow y^4P^o$	0.2996	0.2825	1.715E-02	12	12	7.762E-02	1.630E+02	1.833E+05
	155 818.710	158 038.600	2.030E-02	6	6	6.433E-02	5.705E+01	2.129E+05
	155 818.710	157 579.680	1.610E-02	6	4	2.187E-02	2.445E+01	6.829E+04
	156 029.540	158 038.600	1.840E-02	4	6	3.749E-02	2.445E+01	6.796E+04
	156 029.540	157 579.680	1.420E-02	4	4	8.572E-03	7.244E+00	1.388E+04
	156 029.540	157 677.320	1.510E-02	4	2	2.849E-02	2.264E+01	1.043E+05
	156 148.480	157 579.680	1.310E-02	2	4	4.942E-02	2.264E+01	3.406E+04
	156 148.480	157 677.320	1.400E-02	2	2	1.056E-02	4.527E+00	1.663E+04
$c^4P^o \rightarrow y^4D^o$	0.2996	0.2878	1.187E-02	12	20	1.632E-05	4.949E-02	1.108E+01
	155 818.710	157 558.770	1.590E-02	6	8	1.749E-05	1.979E-02	2.663E+01
	155 818.710	157 173.690	1.240E-02	6	6	3.068E-06	4.454E-03	3.789E+00
	155 818.710	156 939.500	1.020E-02	6	4	2.804E-07	4.949E-04	3.515E-01
	156 029.540	157 173.690	1.050E-02	4	6	9.093E-06	1.039E-02	5.368E+00
	156 029.540	156 939.500	8.300E-03	4	4	3.651E-06	5.279E-03	2.020E+00
	156 029.540	156 829.750	7.300E-03	4	2	5.017E-07	8.248E-04	4.295E-01
	156 148.480	156 939.500	7.200E-03	2	4	4.949E-06	4.124E-03	1.030E+00
	156 148.480	156 829.750	6.200E-03	2	2	4.261E-06	4.124E-03	1.316E+00
$a^4D^o \rightarrow z^4P^o$	0.6797	0.5362	1.435E-01	20	12	8.286E-02	3.464E+01	2.284E+07
	114 279.330	130 134.160	1.445E-01	8	6	8.343E-02	1.386E+01	1.866E+07
	114 231.040	130 134.160	1.450E-01	6	6	2.512E-02	3.118E+00	4.242E+06
	114 200.540	130 134.160	1.452E-01	4	6	4.192E-03	3.464E-01	4.732E+05
	114 231.040	129 858.180	1.425E-01	6	4	5.760E-02	7.275E+00	1.409E+07
	114 200.540	129 858.180	1.427E-01	4	4	4.394E-02	3.695E+00	7.188E+06
	114 162.300	129 858.180	1.431E-01	2	4	1.377E-02	5.774E-01	1.133E+06
	114 200.540	129 787.830	1.420E-01	4	2	3.416E-02	2.887E+00	1.107E+07
	114 162.300	129 787.830	1.424E-01	2	2	6.852E-02	2.887E+00	1.116E+07
$a^4D^o \rightarrow y^4P^o$	0.6797	0.2825	3.972E-01	20	12	5.026E-03	7.592E-01	1.062E+07
	114 279.330	158 038.600	3.988E-01	8	6	5.046E-03	3.037E-01	8.595E+06
	114 231.040	158 038.600	3.993E-01	6	6	1.516E-03	6.833E-02	1.941E+06
	114 200.540	158 038.600	3.995E-01	4	6	2.528E-04	7.592E-03	2.160E+05
	114 231.040	157 579.680	3.951E-01	6	4	3.500E-03	1.594E-01	6.582E+06
	114 200.540	157 579.680	3.953E-01	4	4	2.668E-03	8.098E-02	3.348E+06
	114 162.300	157 579.680	3.957E-01	2	4	8.345E-04	1.265E-02	5.248E+05
	114 200.540	157 677.320	3.962E-01	4	2	2.089E-03	6.327E-02	5.268E+06
	114 162.300	157 677.320	3.966E-01	2	2	4.182E-03	6.327E-02	5.284E+06
$a^4D^o \rightarrow z^4D^o$	0.6797	0.5517	1.280E-01	20	20	2.308E-02	1.081E+01	3.039E+06
	114 279.330	128 599.160	1.305E-01	8	8	2.017E-02	3.709E+00	2.759E+06
	114 279.330	128 233.200	1.271E-01	8	6	3.265E-03	6.164E-01	5.648E+05
	114 231.040	128 599.160	1.310E-01	6	8	4.486E-03	6.164E-01	4.638E+05
	114 231.040	128 233.200	1.276E-01	6	6	1.319E-02	1.860E+00	1.724E+06
	114 231.040	127 976.340	1.253E-01	6	4	5.270E-03	7.570E-01	9.968E+05
	114 200.540	128 233.200	1.278E-01	4	6	8.062E-03	7.570E-01	7.051E+05
	114 200.540	127 976.340	1.255E-01	4	4	9.048E-03	8.652E-01	1.145E+06
	114 200.540	127 825.080	1.241E-01	4	2	5.592E-03	5.407E-01	1.384E+06
	114 162.300	127 976.340	1.259E-01	2	4	1.135E-02	5.407E-01	7.223E+05
	114 162.300	127 825.080	1.245E-01	2	2	1.122E-02	5.407E-01	1.397E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
<b>a <math>^4\text{D}^{\circ} \rightarrow y \text{ } ^4\text{D}^{\circ}</math></b>	0.6797	0.2878	3.919E-01	20	20	3.206E-04	4.907E-02	3.955E+05
	114 279.330	157 558.770	3.944E-01	8	8	2.766E-04	1.683E-02	3.456E+05
	114 279.330	157 173.690	3.909E-01	8	6	4.556E-05	2.797E-03	7.456E+04
	114 231.040	157 558.770	3.949E-01	6	8	6.137E-05	2.797E-03	5.765E+04
	114 231.040	157 173.690	3.914E-01	6	6	1.835E-04	8.441E-03	2.258E+05
	114 231.040	156 939.500	3.892E-01	6	4	7.428E-05	3.435E-03	1.356E+05
	114 200.540	157 173.690	3.916E-01	4	6	1.121E-04	3.435E-03	9.205E+04
	114 200.540	156 939.500	3.894E-01	4	4	1.274E-04	3.926E-03	1.552E+05
	114 200.540	156 829.750	3.884E-01	4	2	7.942E-05	2.454E-03	1.925E+05
	114 162.300	156 939.500	3.898E-01	2	4	1.594E-04	2.454E-03	9.727E+04
	114 162.300	156 829.750	3.888E-01	2	2	1.590E-04	2.454E-03	1.931E+05
<b>b <math>^4\text{D}^{\circ} \rightarrow y \text{ } ^4\text{P}^{\circ}</math></b>	0.3237	0.2825	4.118E-02	20	12	1.930E-01	2.812E+02	4.383E+06
	153 413.740	158 038.600	4.220E-02	8	6	1.978E-01	1.125E+02	3.773E+06
	153 283.070	158 038.600	4.340E-02	6	6	6.103E-02	2.531E+01	9.234E+05
	153 201.950	158 038.600	4.410E-02	4	6	1.034E-02	2.812E+00	1.076E+05
	153 283.070	157 579.680	3.920E-02	6	4	1.286E-01	5.906E+01	2.381E+06
	153 201.950	157 579.680	3.990E-02	4	4	9.975E-02	3.000E+01	1.276E+06
	153 153.900	157 579.680	4.040E-02	2	4	3.156E-02	4.687E+00	2.069E+05
	153 201.950	157 677.320	4.080E-02	4	2	7.969E-02	2.344E+01	2.131E+06
	153 153.900	157 677.320	4.130E-02	2	2	1.613E-01	2.344E+01	2.210E+06
<b>b <math>^4\text{D}^{\circ} \rightarrow y \text{ } ^4\text{D}^{\circ}</math></b>	0.3237	0.2878	3.591E-02	20	20	6.435E-02	1.075E+02	6.664E+05
	153 413.740	157 558.770	3.780E-02	8	8	5.809E-02	3.688E+01	6.667E+05
	153 413.740	157 173.690	3.430E-02	8	6	8.760E-03	6.129E+00	1.104E+05
	153 283.070	157 558.770	3.900E-02	6	8	1.328E-02	6.129E+00	1.217E+05
	153 283.070	157 173.690	3.550E-02	6	6	3.648E-02	1.850E+01	3.692E+05
	153 283.070	156 939.500	3.330E-02	6	4	1.393E-02	7.527E+00	1.860E+05
	153 201.950	157 173.690	3.620E-02	4	6	2.271E-02	7.527E+00	1.593E+05
	153 201.950	156 939.500	3.400E-02	4	4	2.437E-02	8.603E+00	2.263E+05
	153 201.950	156 829.750	3.300E-02	4	2	1.479E-02	5.377E+00	2.587E+05
	153 153.900	156 939.500	3.450E-02	2	4	3.092E-02	5.377E+00	1.478E+05
	153 153.900	156 829.750	3.350E-02	2	2	3.002E-02	5.377E+00	2.706E+05
<b>a <math>^4\text{F}^{\circ} \rightarrow z \text{ } ^4\text{D}^{\circ}</math></b>	0.7136	0.5517	1.620E-01	28	20	1.158E-01	6.003E+01	3.416E+07
	110 766.560	128 599.160	1.625E-01	10	8	1.161E-01	2.144E+01	3.079E+07
	110 508.710	128 599.160	1.649E-01	8	8	1.679E-02	2.444E+00	3.668E+06
	110 313.400	128 599.160	1.667E-01	6	8	1.152E-03	1.244E-01	1.928E+05
	110 508.710	128 233.200	1.615E-01	8	6	9.897E-02	1.471E+01	2.765E+07
	110 313.400	128 233.200	1.633E-01	6	6	2.840E-02	3.130E+00	6.083E+06
	110 177.020	128 233.200	1.645E-01	4	6	2.351E-03	1.715E-01	3.407E+05
	110 313.400	127 976.340	1.610E-01	6	4	8.630E-02	9.648E+00	2.695E+07
	110 177.020	127 976.340	1.622E-01	4	4	3.246E-02	2.401E+00	6.859E+06
	110 177.020	127 825.080	1.608E-01	4	2	8.045E-02	6.003E+00	3.341E+07
<b>a <math>^4\text{F}^{\circ} \rightarrow y \text{ } ^4\text{D}^{\circ}</math></b>	0.7136	0.2878	4.259E-01	28	20	6.962E-03	1.373E+00	1.420E+07
	110 766.560	157 558.770	4.264E-01	10	8	6.971E-03	4.904E-01	1.273E+07
	110 508.710	157 558.770	4.288E-01	8	8	9.989E-04	5.591E-02	1.475E+06
	110 313.400	157 558.770	4.306E-01	6	8	6.805E-05	2.845E-03	7.601E+04
	110 508.710	157 173.690	4.253E-01	8	6	5.962E-03	3.364E-01	1.155E+07
	110 313.400	157 173.690	4.271E-01	6	6	1.699E-03	7.160E-02	2.489E+06
	110 177.020	157 173.690	4.283E-01	4	6	1.400E-04	3.923E-03	1.376E+05
	110 313.400	156 939.500	4.249E-01	6	4	5.210E-03	2.207E-01	1.133E+07
	110 177.020	156 939.500	4.261E-01	4	4	1.950E-03	5.493E-02	2.844E+06
	110 177.020	156 829.750	4.251E-01	4	2	4.865E-03	1.373E-01	1.412E+07
<b>b <math>^4\text{F}^{\circ} \rightarrow y \text{ } ^4\text{D}^{\circ}</math></b>	0.3326	0.2878	4.488E-02	28	20	2.580E-01	4.829E+02	5.844E+06
	152 615.460	157 558.770	4.510E-02	10	8	2.593E-01	1.725E+02	5.295E+06
	152 305.000	157 558.770	4.790E-02	8	8	3.924E-02	1.966E+01	7.232E+05
	152 094.640	157 558.770	4.980E-02	6	8	2.768E-03	1.000E+00	4.135E+04
	152 305.000	157 173.690	4.440E-02	8	6	2.189E-01	1.183E+02	4.621E+06
	152 094.640	157 173.690	4.630E-02	6	6	6.477E-02	2.518E+01	1.115E+06
	151 959.690	157 173.690	4.750E-02	4	6	5.462E-03	1.380E+00	6.599E+04
	152 094.640	156 939.500	4.410E-02	6	4	1.902E-01	7.761E+01	4.456E+06
	151 959.690	156 939.500	4.530E-02	4	4	7.292E-02	1.932E+01	1.202E+06
	151 959.690	156 829.750	4.430E-02	4	2	1.783E-01	4.829E+01	5.621E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^4P^o \rightarrow c^4P^o$	0.5362	0.5294	6.814E-03	12	12	6.164E-03	3.257E+01	2.299E+03
	130 134.160	130 602.210	4.200E-03	6	6	2.660E-03	1.140E+01	3.768E+02
	130 134.160	130 818.850	6.200E-03	6	4	1.683E-03	4.885E+00	7.793E+02
	129 858.180	130 602.210	6.700E-03	4	6	2.727E-03	4.885E+00	6.556E+02
	129 858.180	130 818.850	8.700E-03	4	4	1.049E-03	1.447E+00	6.380E+02
	129 858.180	130 948.940	9.900E-03	4	2	3.732E-03	4.523E+00	5.875E+03
	129 787.830	130 818.850	9.400E-03	2	4	7.086E-03	4.523E+00	2.515E+03
	129 787.830	130 948.940	1.060E-02	2	2	1.598E-03	9.046E01	1.442E+03
$z^4P^o \rightarrow d^4P^o$	0.5362	0.3473	1.889E-01	12	12	1.962E-01	3.738E+01	5.625E+07
	130 134.160	150 996.410	1.901E-01	6	6	1.382E-01	1.308E+01	4.011E+07
	130 134.160	150 531.310	1.858E-01	6	4	5.787E-02	5.607E+00	2.407E+07
	129 858.180	150 996.410	1.926E-01	4	6	8.999E-02	5.607E+00	1.788E+07
	129 858.180	150 531.310	1.883E-01	4	4	2.607E-02	1.661E+00	7.424E+06
	129 858.180	150 258.510	1.859E-01	4	2	8.042E-02	5.191E+00	4.465E+07
	129 787.830	150 531.310	1.890E-01	2	4	1.635E-01	5.191E+00	2.346E+07
	129 787.830	150 258.510	1.866E-01	2	2	3.229E-02	1.038E+00	9.031E+06
$z^4P^o \rightarrow e^4P^o$	0.5362	0.2996	2.366E-01	12	12	2.016E-01	3.067E+01	9.060E+07
	130 134.160	155 818.710	2.340E-01	6	6	1.396E-01	1.074E+01	6.138E+07
	130 134.160	156 029.540	2.359E-01	6	4	6.030E-02	4.601E+00	4.043E+07
	129 858.180	155 818.710	2.365E-01	4	6	9.068E-02	4.601E+00	2.716E+07
	129 858.180	156 029.540	2.384E-01	4	4	2.708E-02	1.363E+00	1.236E+07
	129 858.180	156 148.480	2.395E-01	4	2	8.503E-02	4.260E+00	7.835E+07
	129 787.830	156 029.540	2.391E-01	2	4	1.698E-01	4.260E+00	3.898E+07
	129 787.830	156 148.480	2.402E-01	2	2	3.411E-02	8.521E-01	1.581E+07
$z^4P^o \rightarrow f^4P^o$	0.5362	0.2063	3.299E-01	12	12	2.549E-02	2.781E+00	2.229E+07
	130 134.160	166 479.820	3.312E-01	6	6	1.791E-02	9.735E-01	1.578E+07
	130 134.160	165 991.350	3.267E-01	6	4	7.572E-03	4.172E-01	9.737E+06
	129 858.180	166 479.820	3.337E-01	4	6	1.160E-02	4.172E-01	6.918E+06
	129 858.180	165 991.350	3.292E-01	4	4	3.391E-03	1.236E-01	2.952E+06
	129 858.180	165 719.230	3.267E-01	4	2	1.052E-02	3.863E-01	1.803E+07
	129 787.830	165 991.350	3.299E-01	2	4	2.124E-02	3.863E-01	9.284E+06
	129 787.830	165 719.230	3.274E-01	2	2	4.216E-03	7.726E-02	3.630E+06
$z^4P^o \rightarrow g^4P^o$	0.5362	0.1868	3.494E-01	12	12	3.250E-02	3.349E+00	3.186E+07
	130 134.160	168 217.100	3.470E-01	6	6	2.259E-02	1.172E+00	2.185E+07
	130 134.160	168 397.890	3.487E-01	6	4	9.731E-03	5.023E-01	1.426E+07
	129 858.180	168 217.100	3.495E-01	4	6	1.463E-02	5.023E-01	9.569E+06
	129 858.180	168 397.890	3.512E-01	4	4	4.356E-03	1.488E-01	4.315E+06
	129 858.180	168 490.430	3.520E-01	4	2	1.364E-02	4.651E-01	2.715E+07
	129 787.830	168 397.890	3.519E-01	2	4	2.728E-02	4.651E-01	1.357E+07
	129 787.830	168 490.430	3.527E-01	2	2	5.468E-03	9.302E-02	5.463E+06
$z^4P^o \rightarrow h^4P^o$	0.5362	0.1369	3.993E-01	12	12	9.135E-03	8.237E-01	1.170E+07
	130 134.160	174 098.100	4.006E-01	6	6	6.416E-03	2.883E-01	8.270E+06
	130 134.160	173 595.770	3.960E-01	6	4	2.718E-03	1.236E-01	5.136E+06
	129 858.180	174 098.100	4.031E-01	4	6	4.150E-03	1.236E-01	3.611E+06
	129 858.180	173 595.770	3.985E-01	4	4	1.216E-03	3.661E-02	1.551E+06
	129 858.180	173 316.830	3.960E-01	4	2	3.775E-03	1.144E-01	9.510E+06
	129 787.830	173 595.770	3.992E-01	2	4	7.611E-03	1.144E-01	4.871E+06
	129 787.830	173 316.830	3.967E-01	2	2	1.513E-03	2.288E-02	1.912E+06
$z^4P^o \rightarrow i^4P^o$	0.5362	0.1263	4.099E-01	12	12	1.050E-02	9.221E-01	1.417E+07
	130 134.160	174 892.750	4.078E-01	6	6	7.312E-03	3.227E-01	9.767E+06
	130 134.160	175 019.780	4.090E-01	6	4	3.143E-03	1.383E-01	6.334E+06
	129 858.180	174 892.750	4.103E-01	4	6	4.729E-03	1.383E-01	4.263E+06
	129 858.180	175 019.780	4.115E-01	4	4	1.405E-03	4.098E-02	1.911E+06
	129 858.180	175 083.510	4.121E-01	4	2	4.398E-03	1.281E-01	1.200E+07
	129 787.830	175 019.780	4.122E-01	2	4	8.798E-03	1.281E-01	6.004E+06
	129 787.830	175 083.510	4.128E-01	2	2	1.762E-03	2.561E-02	2.412E+06

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
$z^4P^o \rightarrow j^4P^o$	0.5362	0.0905	4.457E-01	12	12	4.550E-03	3.675E-01	7.259E+06
	130 134.160	178 848.960	4.439E-01	6	6	3.172E-03	1.286E-01	5.021E+06
	130 134.160	178 915.200	4.445E-01	6	4	1.361E-03	5.513E-02	3.241E+06
	129 858.180	178 848.960	4.464E-01	4	6	2.051E-03	5.513E-02	2.188E+06
	129 858.180	178 915.200	4.470E-01	4	4	6.085E-04	1.633E-02	9.765E+05
	129 858.180	178 969.320	4.475E-01	4	2	1.904E-03	5.105E-02	6.124E+06
	129 787.830	178 915.200	4.477E-01	2	4	3.809E-03	5.105E-02	3.066E+06
	129 787.830	178 969.320	4.482E-01	2	2	7.626E-04	1.021E-02	1.231E+06
$z^4P^o \rightarrow b^4D^o$	0.5362	0.3237	2.125E-01	12	20	7.842E-01	1.328E+02	1.707E+08
	130 134.160	153 413.740	2.121E-01	6	8	6.261E-01	5.314E+01	1.697E+08
	130 134.160	153 283.070	2.109E-01	6	6	1.401E-01	1.196E+01	5.004E+07
	130 134.160	153 201.950	2.102E-01	6	4	1.551E-02	1.328E+00	8.258E+06
	129 858.180	153 283.070	2.134E-01	4	6	4.961E-01	2.790E+01	1.210E+08
	129 858.180	153 201.950	2.127E-01	4	4	2.512E-01	1.417E+01	9.127E+07
	129 858.180	153 153.900	2.122E-01	4	2	3.915E-02	2.214E+00	2.832E+07
	129 787.830	153 201.950	2.134E-01	2	4	3.937E-01	1.107E+01	7.201E+07
	129 787.830	153 153.900	2.129E-01	2	2	3.928E-01	1.107E+01	1.430E+08
$z^4P^o \rightarrow c^4D^o$	0.5362	0.1950	3.412E-01	12	20	6.765E-02	7.138E+00	3.795E+07
	130 134.160	167 575.230	3.412E-01	6	8	5.412E-02	2.855E+00	3.796E+07
	130 134.160	167 364.980	3.392E-01	6	6	1.211E-02	6.424E-01	1.119E+07
	130 134.160	167 291.840	3.386E-01	6	4	1.343E-03	7.138E-02	1.855E+06
	129 858.180	167 364.980	3.417E-01	4	6	4.268E-02	1.499E+00	2.669E+07
	129 858.180	167 291.840	3.411E-01	4	4	2.164E-02	7.614E-01	2.023E+07
	129 858.180	167 254.840	3.407E-01	4	2	3.378E-03	1.190E-01	6.299E+06
	129 787.830	167 291.840	3.418E-01	2	4	3.389E-02	5.949E-01	1.590E+07
	129 787.830	167 254.840	3.414E-01	2	2	3.385E-02	5.949E-01	3.169E+07
$z^4P^o \rightarrow d^4D^o$ *	0.5362	0.1319	4.043E-01	12	20	1.867E-02	1.663E+00	1.471E+07
		*		6	8	1.494E-02	6.652E-01	1.471E+07
	130 134.160	174 360.920	4.030E-01	6	6	3.351E-03	1.497E-01	4.371E+06
	130 134.160	174 329.310	4.027E-01	6	4	3.720E-04	1.663E-02	7.269E+05
	129 858.180	174 360.920	4.055E-01	4	6	1.180E-02	3.492E-01	1.039E+07
	129 858.180	174 329.310	4.052E-01	4	4	5.989E-03	1.774E-01	7.899E+06
		*		4	2	9.337E-04	2.772E-02	2.451E+06
	129 787.830	174 329.310	4.059E-01	2	4	9.375E-03	1.386E-01	6.203E+06
				2	2	9.337E-03	1.386E-01	1.226E+07
$z^4P^o \rightarrow e^4D^o$ *	0.5362	0.0955	4.407E-01	12	20	7.818E-03	6.387E-01	7.317E+06
		*		6	8	6.254E-03	2.555E-01	7.317E+06
	130 134.160	178 344.360	4.393E-01	6	6	1.403E-03	5.748E-02	2.175E+06
		*		6	4	1.564E-04	6.387E-03	3.659E+05
	129 858.180	178 344.360	4.418E-01	4	6	4.938E-03	1.341E-01	5.161E+06
		*		4	4	2.502E-03	6.812E-02	3.903E+06
		*		4	2	3.909E-04	1.064E-02	1.220E+06
		*		2	4	3.909E-03	5.322E-02	3.049E+06
		*		2	2	3.909E-03	5.322E-02	6.098E+06
$y^4P^o \rightarrow f^4P^o$	0.2825	0.2063	7.623E-02	12	12	3.009E-01	1.421E+02	1.404E+07
	158 038.600	166 479.820	7.690E-02	6	6	2.125E-01	4.973E+01	1.009E+07
	158 038.600	165 991.350	7.240E-02	6	4	8.573E-02	2.131E+01	5.414E+06
	157 579.680	166 479.820	8.110E-02	4	6	1.440E-01	2.131E+01	5.073E+06
	157 579.680	165 991.350	7.660E-02	4	4	4.031E-02	6.315E+00	1.900E+06
	157 579.680	165 719.230	7.410E-02	4	2	1.219E-01	1.973E+01	1.075E+07
	157 677.320	165 991.350	7.570E-02	2	4	2.490E-01	1.973E+01	5.730E+06
	157 677.320	165 719.230	7.320E-02	2	2	4.815E-02	3.947E+00	2.072E+06
$y^4P^o \rightarrow g^4P^o$	0.2825	0.1868	9.566E-02	12	12	2.546E-01	9.581E+01	1.871E+07
	158 038.600	168 217.100	9.270E-02	6	6	1.727E-01	3.353E+01	1.192E+07
	158 038.600	168 397.890	9.440E-02	6	4	7.537E-02	1.437E+01	8.093E+06
	157 579.680	168 217.100	9.690E-02	4	6	1.161E-01	1.437E+01	5.835E+06
	157 579.680	168 397.890	9.860E-02	4	4	3.499E-02	4.258E+00	2.732E+06
	157 579.680	168 490.430	9.940E-02	4	2	1.102E-01	1.331E+01	1.750E+07
	157 677.320	168 397.890	9.770E-02	2	4	2.167E-01	1.331E+01	8.307E+06
	157 677.320	168 490.430	9.850E-02	2	2	4.369E-02	2.661E+00	3.405E+06



Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ $\text{Ry}$	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^4P^\circ \rightarrow h^4P^\circ$	0.2825	0.1369	1.456E-01	12	12	3.767E-02	9.317E+00	6.413E+06
	158 038.600	174 098.100	1.463E-01	6	6	2.650E-02	3.261E+00	4.556E+06
	158 038.600	173 595.770	1.417E-01	6	4	1.100E-02	1.398E+00	2.661E+06
	157 579.680	174 098.100	1.505E-01	4	6	1.753E-02	1.398E+00	2.126E+06
	157 579.680	173 595.770	1.459E-01	4	4	5.035E-03	4.141E-01	8.608E+05
	157 579.680	173 316.830	1.434E-01	4	2	1.546E-02	1.294E+00	5.108E+06
	157 677.320	173 595.770	1.450E-01	2	4	3.127E-02	1.294E+00	2.641E+06
	157 677.320	173 316.830	1.425E-01	2	2	6.146E-03	2.588E-01	1.003E+06
$y^4P^\circ \rightarrow i^4P^\circ$	0.2825	0.1263	1.562E-01	12	12	4.286E-02	9.877E+00	8.399E+06
	158 038.600	174 892.750	1.535E-01	6	6	2.948E-02	3.457E+00	5.579E+06
	158 038.600	175 019.780	1.547E-01	6	4	1.273E-02	1.482E+00	3.672E+06
	157 579.680	174 892.750	1.577E-01	4	6	1.947E-02	1.482E+00	2.593E+06
	157 579.680	175 019.780	1.589E-01	4	4	5.813E-03	4.390E-01	1.179E+06
	157 579.680	175 083.510	1.595E-01	4	2	1.823E-02	1.372E+00	7.452E+06
	157 677.320	175 019.780	1.580E-01	2	4	3.612E-02	1.372E+00	3.622E+06
	157 677.320	175 083.510	1.586E-01	2	2	7.252E-03	2.744E-01	1.465E+06
$y^4P^\circ \rightarrow j^4P^\circ$	0.2825	0.0905	1.920E-01	12	12	1.486E-02	2.786E+00	4.398E+06
	158 038.600	178 848.960	1.896E-01	6	6	1.027E-02	9.752E-01	2.966E+06
	158 038.600	178 915.200	1.902E-01	6	4	4.416E-03	4.180E-01	1.925E+06
	157 579.680	178 848.960	1.938E-01	4	6	6.750E-03	4.180E-01	1.358E+06
	157 579.680	178 915.200	1.944E-01	4	4	2.006E-03	1.238E-01	6.090E+05
	157 579.680	178 969.320	1.949E-01	4	2	6.285E-03	3.870E-01	3.836E+06
	157 677.320	178 915.200	1.935E-01	2	4	1.248E-02	3.870E-01	1.877E+06
	157 677.320	178 969.320	1.940E-01	2	2	2.503E-03	7.740E-02	7.565E+05
$y^4P^\circ \rightarrow c^4D^\circ$	0.2825	0.1950	8.746E-02	12	20	9.599E-01	3.951E+02	3.539E+07
	158 038.600	167 575.230	8.690E-02	6	8	7.630E-01	1.580E+02	3.471E+07
	158 038.600	167 364.980	8.490E-02	6	6	1.677E-01	3.556E+01	9.711E+06
	158 038.600	167 291.840	8.430E-02	6	4	1.850E-02	3.951E+00	1.584E+06
	157 579.680	167 364.980	8.910E-02	4	6	6.161E-01	8.297E+01	2.619E+07
	157 579.680	167 291.840	8.850E-02	4	4	3.108E-01	4.214E+01	1.955E+07
	157 579.680	167 254.840	8.810E-02	4	2	4.835E-02	6.585E+00	6.028E+06
	157 677.320	167 291.840	8.760E-02	2	4	4.807E-01	3.293E+01	1.481E+07
	157 677.320	167 254.840	8.720E-02	2	2	4.785E-01	3.293E+01	2.923E+07
$y^4P^\circ \rightarrow d^4D^\circ$ *	0.2825	0.1319	1.506E-01	12	20	1.044E-01	2.497E+01	1.141E+07
		*		6	8	8.354E-02	9.987E+00	1.141E+07
	158 038.600	174 360.920	1.487E-01	6	6	1.856E-02	2.247E+00	3.297E+06
	158 038.600	174 329.310	1.484E-01	6	4	2.058E-03	2.497E-01	5.462E+05
	157 579.680	174 360.920	1.529E-01	4	6	6.681E-02	5.243E+00	8.363E+06
	157 579.680	174 329.310	1.526E-01	4	4	3.387E-02	2.663E+00	6.335E+06
		*		4	2	5.221E-03	4.161E-01	1.902E+06
	157 677.320	174 329.310	1.517E-01	2	4	5.261E-02	2.081E+00	4.862E+06
		*		2	2	5.221E-02	2.081E+00	9.508E+06
$y^4P^\circ \rightarrow e^4D^\circ$ *	0.2825	0.0955	1.870E-01	12	20	3.273E-02	6.301E+00	5.515E+06
		*		6	8	2.618E-02	2.521E+00	5.515E+06
	158 038.600	178 344.360	1.850E-01	6	6	5.829E-03	5.671E-01	1.602E+06
		*		6	4	6.546E-04	6.301E-02	2.757E+05
	157 579.680	178 344.360	1.892E-01	4	6	2.086E-02	1.323E+00	3.999E+06
		*		4	4	1.047E-02	6.722E-01	2.941E+06
		*		4	2	1.636E-03	1.050E-01	9.191E+05
		*		2	4	1.636E-02	5.251E-01	2.298E+06
		*		2	2	1.636E-02	5.251E-01	4.596E+06
$z^4D^\circ \rightarrow c^4P^\circ$	0.5517	0.5294	2.228E-02	20	12	2.144E-04	5.773E-01	1.424E+03
	128 599.160	130 602.210	1.820E-02	8	6	1.751E-04	2.309E-01	6.212E+02
	128 233.200	130 602.210	2.160E-02	6	6	6.235E-05	5.196E-02	2.337E+02
	127 976.340	130 602.210	2.390E-02	4	6	1.150E-05	5.773E-03	3.517E+01
	128 233.200	130 818.850	2.360E-02	6	4	1.590E-04	1.212E-01	1.067E+03
	127 976.340	130 818.850	2.590E-02	4	4	1.329E-04	6.158E-02	7.161E+02
	127 825.080	130 818.850	2.730E-02	2	4	4.378E-05	9.622E-03	1.310E+02
	127 976.340	130 948.940	2.710E-02	4	2	1.086E-04	4.811E-02	1.282E+03
	127 825.080	130 948.940	2.850E-02	2	2	2.285E-04	4.811E-02	1.491E+03

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
$z^4D^o \rightarrow d^4P^o$	0.5517	0.3473	2.044E-01	20	12	2.188E-01	6.421E+01	1.224E+08
128 599.160	150 996.410	2.041E-01	8	6	2.184E-01	2.568E+01	9.745E+07	
128 233.200	150 996.410	2.075E-01	6	6	6.662E-02	5.779E+00	2.304E+07	
127 976.340	150 996.410	2.098E-01	4	6	1.123E-02	6.421E-01	2.646E+06	
128 233.200	150 531.310	2.032E-01	6	4	1.522E-01	1.348E+01	7.573E+07	
127 976.340	150 531.310	2.055E-01	4	4	1.173E-01	6.849E+00	3.979E+07	
127 825.080	150 531.310	2.069E-01	2	4	3.690E-02	1.070E+00	6.344E+06	
127 976.340	150 258.510	2.031E-01	4	2	9.056E-02	5.351E+00	6.001E+07	
127 825.080	150 258.510	2.045E-01	2	2	1.824E-01	5.351E+00	6.126E+07	
$z^4D^o \rightarrow e^4P^o$	0.5517	0.2996	2.520E-01	20	12	6.271E-03	1.493E+00	5.332E+06
128 599.160	155 818.710	2.480E-01	8	6	6.170E-03	5.971E-01	4.064E+06	
128 233.200	155 818.710	2.514E-01	6	6	1.876E-03	1.344E-01	9.526E+05	
127 976.340	155 818.710	2.537E-01	4	6	3.156E-04	1.493E-02	1.088E+05	
128 233.200	156 029.540	2.533E-01	6	4	4.412E-03	3.135E-01	3.410E+06	
127 976.340	156 029.540	2.556E-01	4	4	3.392E-03	1.592E-01	1.780E+06	
127 825.080	156 029.540	2.570E-01	2	4	1.066E-03	2.488E-02	2.827E+05	
127 976.340	156 148.480	2.567E-01	4	2	2.661E-03	1.244E-01	2.817E+06	
127 825.080	156 148.480	2.581E-01	2	2	5.351E-03	1.244E-01	2.863E+06	
$z^4D^o \rightarrow f^4P^o$	0.5517	0.2063	3.454E-01	20	12	2.721E-02	4.726E+00	4.345E+07
128 599.160	166 479.820	3.452E-01	8	6	2.719E-02	1.891E+00	3.470E+07	
128 233.200	166 479.820	3.486E-01	6	6	8.238E-03	4.254E-01	8.041E+06	
127 976.340	166 479.820	3.509E-01	4	6	1.382E-03	4.726E-02	9.112E+05	
128 233.200	165 991.350	3.441E-01	6	4	1.897E-02	9.925E-01	2.707E+07	
127 976.340	165 991.350	3.464E-01	4	4	1.455E-02	5.041E-01	1.403E+07	
127 825.080	165 991.350	3.478E-01	2	4	4.566E-03	7.877E-02	2.218E+06	
127 976.340	165 719.230	3.439E-01	4	2	1.129E-02	3.939E-01	2.144E+07	
127 825.080	165 719.230	3.453E-01	2	2	2.267E-02	3.939E-01	2.171E+07	
$z^4D^o \rightarrow g^4P^o$	0.5517	0.1868	3.648E-01	20	12	1.241E-03	2.041E-01	2.211E+06
128 599.160	168 217.100	3.610E-01	8	6	1.228E-03	8.163E-02	1.714E+06	
128 233.200	168 217.100	3.644E-01	6	6	3.718E-04	1.837E-02	3.966E+05	
127 976.340	168 217.100	3.667E-01	4	6	6.236E-05	2.041E-03	4.490E+04	
128 233.200	168 397.890	3.661E-01	6	4	8.716E-04	4.286E-02	1.408E+06	
127 976.340	168 397.890	3.684E-01	4	4	6.683E-04	2.177E-02	7.285E+05	
127 825.080	168 397.890	3.698E-01	2	4	2.096E-04	3.401E-03	1.151E+05	
127 976.340	168 490.430	3.692E-01	4	2	5.232E-04	1.701E-02	1.146E+06	
127 825.080	168 490.430	3.706E-01	2	2	1.050E-03	1.701E-02	1.159E+06	
$z^4D^o \rightarrow h^4P^o$	0.5517	0.1369	4.147E-01	20	12	9.652E-03	1.396E+00	2.223E+07
128 599.160	174 098.100	4.146E-01	8	6	9.649E-03	5.585E-01	1.776E+07	
128 233.200	174 098.100	4.180E-01	6	6	2.918E-03	1.257E-01	4.096E+06	
127 976.340	174 098.100	4.203E-01	4	6	4.891E-04	1.396E-02	4.626E+05	
128 233.200	173 595.770	4.134E-01	6	4	6.735E-03	2.932E-01	1.387E+07	
127 976.340	173 595.770	4.157E-01	4	4	5.160E-03	1.489E-01	7.162E+06	
127 825.080	173 595.770	4.171E-01	2	4	1.618E-03	2.327E-02	1.130E+06	
127 976.340	173 316.830	4.132E-01	4	2	4.007E-03	1.164E-01	1.099E+07	
127 825.080	173 316.830	4.146E-01	2	2	8.041E-03	1.164E-01	1.110E+07	
$z^4D^o \rightarrow i^4P^o$	0.5517	0.1263	4.254E-01	20	12	4.625E-04	6.523E-02	1.120E+06
128 599.160	174 892.750	4.218E-01	8	6	4.586E-04	2.609E-02	8.738E+05	
128 233.200	174 892.750	4.252E-01	6	6	1.387E-04	5.871E-03	2.014E+05	
127 976.340	174 892.750	4.275E-01	4	6	2.324E-05	6.523E-04	2.274E+04	
128 233.200	175 019.780	4.264E-01	6	4	3.245E-04	1.370E-02	7.108E+05	
127 976.340	175 019.780	4.287E-01	4	4	2.486E-04	6.958E-03	3.669E+05	
127 825.080	175 019.780	4.301E-01	2	4	7.793E-05	1.087E-03	5.790E+04	
127 976.340	175 083.510	4.293E-01	4	2	1.945E-04	5.436E-03	5.757E+05	
127 825.080	175 083.510	4.307E-01	2	2	3.902E-04	5.436E-03	5.814E+05	

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
$z^4D^{\circ} \rightarrow j^4P^{\circ}$	0.5517	0.0905	4.611E-01	20	12	2.250E-04	2.927E-02	6.404E+05
	128 599.160	178 848.960	4.579E-01	8	6	2.234E-04	1.171E-02	5.016E+05
	128 233.200	178 848.960	4.613E-01	6	6	6.751E-05	2.634E-03	1.154E+05
	127 976.340	178 848.960	4.636E-01	4	6	1.131E-05	2.927E-04	1.301E+04
	128 233.200	178 915.200	4.619E-01	6	4	1.577E-04	6.147E-03	4.055E+05
	127 976.340	178 915.200	4.642E-01	4	4	1.208E-04	3.122E-03	2.090E+05
	127 825.080	178 915.200	4.656E-01	2	4	3.786E-05	4.879E-04	3.296E+04
	127 976.340	178 969.320	4.647E-01	4	2	9.446E-05	2.439E-03	3.277E+05
	127 825.080	178 969.320	4.661E-01	2	2	1.895E-04	2.439E-03	3.307E+05
$z^4D^{\circ} \rightarrow b^4D^{\circ}$	0.5517	0.3237	2.280E-01	20	20	1.478E-01	3.890E+01	6.172E+07
	128 599.160	153 413.740	2.261E-01	8	8	1.257E-01	1.334E+01	5.162E+07
	128 599.160	153 283.070	2.249E-01	8	6	2.078E-02	2.218E+00	1.126E+07
	128 233.200	153 413.740	2.295E-01	6	8	2.827E-02	2.218E+00	8.971E+06
	128 233.200	153 283.070	2.283E-01	6	6	8.487E-02	6.691E+00	3.553E+07
	128 233.200	153 201.950	2.276E-01	6	4	3.443E-02	2.723E+00	2.149E+07
	127 976.340	153 283.070	2.306E-01	4	6	5.233E-02	2.723E+00	1.490E+07
	127 976.340	153 201.950	2.299E-01	4	4	5.963E-02	3.112E+00	2.531E+07
	127 976.340	153 153.900	2.294E-01	4	2	3.719E-02	1.945E+00	3.144E+07
	127 825.080	153 201.950	2.313E-01	2	4	7.499E-02	1.945E+00	1.611E+07
	127 825.080	153 153.900	2.308E-01	2	2	7.482E-02	1.945E+00	3.202E+07
$z^4D^{\circ} \rightarrow c^4D^{\circ}$	0.5517	0.1950	3.566E-01	20	20	1.483E-02	2.496E+00	1.515E+07
	128 599.160	167 575.230	3.552E-01	8	8	1.267E-02	8.560E-01	1.284E+07
	128 599.160	167 364.980	3.532E-01	8	6	2.094E-03	1.423E-01	2.797E+06
	128 233.200	167 575.230	3.586E-01	6	8	2.834E-03	1.423E-01	2.195E+06
	128 233.200	167 364.980	3.566E-01	6	6	8.504E-03	4.293E-01	8.686E+06
	128 233.200	167 291.840	3.560E-01	6	4	3.455E-03	1.747E-01	5.276E+06
	127 976.340	167 364.980	3.589E-01	4	6	5.225E-03	1.747E-01	3.604E+06
	127 976.340	167 291.840	3.583E-01	4	4	5.962E-03	1.997E-01	6.147E+06
	127 976.340	167 254.840	3.579E-01	4	2	3.722E-03	1.248E-01	7.658E+06
	127 825.080	167 291.840	3.597E-01	2	4	7.481E-03	1.248E-01	3.887E+06
	127 825.080	167 254.840	3.593E-01	2	2	7.473E-03	1.248E-01	7.749E+06
$z^4D^{\circ} \rightarrow d^4D^{\circ}$ *	0.5517	0.1319	4.197E-01	20	20	4.330E-03	6.190E-01	6.127E+06
		*		8	8	3.711E-03	2.123E-01	5.248E+06
	128 599.160	174 360.920	4.170E-01	8	6	6.130E-04	3.528E-02	1.142E+06
		*		6	8	8.248E-04	3.528E-02	8.797E+05
	128 233.200	174 360.920	4.204E-01	6	6	2.486E-03	1.065E-01	3.530E+06
	128 233.200	174 329.310	4.201E-01	6	4	1.011E-03	4.333E-02	2.150E+06
	127 976.340	174 360.920	4.227E-01	4	6	1.526E-03	4.333E-02	1.460E+06
	127 976.340	174 329.310	4.224E-01	4	4	1.743E-03	4.952E-02	2.498E+06
		*		4	2	1.082E-03	3.095E-02	3.064E+06
	127 825.080	174 329.310	4.238E-01	2	4	2.186E-03	3.095E-02	1.577E+06
		*		2	2	2.165E-03	3.095E-02	3.064E+06
$z^4D^{\circ} \rightarrow e^4D^{\circ}$ *	0.5517	0.0955	4.562E-01	20	20	1.876E-03	2.468E-01	3.135E+06
		*		8	8	1.608E-03	8.464E-02	2.685E+06
	128 599.160	178 344.360	4.533E-01	8	6	2.657E-04	1.407E-02	5.846E+05
		*		6	8	3.573E-04	1.407E-02	4.502E+05
	128 233.200	178 344.360	4.567E-01	6	6	1.077E-03	4.244E-02	1.804E+06
		*		6	4	4.377E-04	1.727E-02	1.097E+06
	127 976.340	178 344.360	4.590E-01	4	6	6.607E-04	1.727E-02	7.454E+05
		*		4	4	7.504E-04	1.974E-02	1.254E+06
		*		4	2	4.690E-04	1.234E-02	1.568E+06
		*		2	4	9.380E-04	1.234E-02	7.838E+05
		*		2	2	9.380E-04	1.234E-02	1.568E+06
$z^4D^{\circ} \rightarrow b^4F^{\circ}$	0.5517	0.3326	2.190E-01	20	28	8.821E-01	2.417E+02	2.428E+08
	128 599.160	152 615.460	2.188E-01	8	10	7.869E-01	8.631E+01	2.421E+08
	128 599.160	152 305.000	2.160E-01	8	8	8.855E-02	9.839E+00	3.319E+07
	128 599.160	152 094.640	2.141E-01	8	6	4.466E-03	5.006E-01	2.192E+06
	128 233.200	152 305.000	2.194E-01	6	8	7.217E-01	5.921E+01	2.093E+08
	128 233.200	152 094.640	2.175E-01	6	6	1.523E-01	1.260E+01	5.786E+07
	128 233.200	151 959.690	2.163E-01	6	4	8.297E-03	6.905E-01	4.677E+06
	127 976.340	152 094.640	2.198E-01	4	6	7.114E-01	3.884E+01	1.840E+08
	127 976.340	151 959.690	2.186E-01	4	4	1.761E-01	9.667E+00	6.759E+07
	127 825.080	151 959.690	2.200E-01	2	4	8.861E-01	2.417E+01	1.722E+08

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^4D^o \rightarrow c^4F^o$	0.5517	0.1993	3.523E-01	20	28	6.994E-02	1.191E+01	4.982E+07
	128 599.160	167 269.150	3.524E-01	8	10	6.246E-02	4.254E+00	4.984E+07
	128 599.160	166 918.270	3.492E-01	8	8	7.056E-03	4.849E-01	6.911E+06
	128 599.160	166 709.270	3.473E-01	8	6	3.570E-04	2.467E-02	4.612E+05
	128 233.200	166 918.270	3.526E-01	6	8	5.716E-02	2.918E+00	4.281E+07
	128 233.200	166 709.270	3.507E-01	6	6	1.210E-02	6.211E-01	1.195E+07
	128 233.200	166 591.080	3.496E-01	6	4	6.610E-04	3.403E-02	9.733E+05
	127 976.340	166 709.270	3.530E-01	4	6	5.631E-02	1.914E+00	3.757E+07
	127 976.340	166 591.080	3.519E-01	4	4	1.397E-02	4.764E-01	1.390E+07
	127 825.080	166 591.080	3.533E-01	2	4	7.014E-02	1.191E+00	3.516E+07
$z^4D^o \rightarrow d^4F^o$ *	0.5517	0.1303	4.214E-01	20	28	1.899E-02	2.704E+00	1.935E+07
	128 599.160	174 529.270	4.185E-01	8	10	1.684E-02	9.658E-01	1.895E+07
	*			8	8	1.938E-03	1.101E-01	2.778E+06
	*			8	6	9.690E-05	5.602E-03	1.789E+05
	*			6	8	1.550E-02	6.626E-01	1.657E+07
	*			6	6	3.308E-03	1.410E-01	4.736E+06
	*			6	4	1.809E-04	7.727E-03	3.870E+05
	*			4	6	1.519E-02	4.346E-01	1.432E+07
	*			4	4	3.799E-03	1.082E-01	5.418E+06
	*			2	4	1.899E-02	2.704E-01	1.354E+07
$y^4D^o \rightarrow f^4P^o$	0.2878	0.2063	8.150E-02	20	12	3.128E-01	2.303E+02	2.782E+07
	157 558.770	166 479.820	8.130E-02	8	6	3.121E-01	9.212E+01	2.209E+07
	157 173.690	166 479.820	8.480E-02	6	6	9.765E-02	2.073E+01	5.640E+06
	156 939.500	166 479.820	8.700E-02	4	6	1.670E-02	2.303E+00	6.768E+05
	157 173.690	165 991.350	8.030E-02	6	4	2.158E-01	4.837E+01	1.676E+07
	156 939.500	165 991.350	8.250E-02	4	4	1.689E-01	2.457E+01	9.233E+06
	156 829.750	165 991.350	8.350E-02	2	4	5.342E-02	3.839E+00	1.496E+06
	156 939.500	165 719.230	8.000E-02	4	2	1.280E-01	1.919E+01	1.315E+07
	156 829.750	165 719.230	8.100E-02	2	2	2.591E-01	1.919E+01	1.365E+07
$y^4D^o \rightarrow g^4P^o$	0.2878	0.1868	1.009E-01	20	12	5.490E-03	3.263E+00	7.488E+05
	157 558.770	168 217.100	9.710E-02	8	6	5.281E-03	1.305E+00	5.333E+05
	157 173.690	168 217.100	1.006E-01	6	6	1.642E-03	2.937E-01	1.334E+05
	156 939.500	168 217.100	1.028E-01	4	6	2.796E-04	3.263E-02	1.582E+04
	157 173.690	168 397.890	1.023E-01	6	4	3.895E-03	6.853E-01	4.911E+05
	156 939.500	168 397.890	1.045E-01	4	4	3.031E-03	3.481E-01	2.659E+05
	156 829.750	168 397.890	1.055E-01	2	4	9.564E-04	5.439E-02	4.275E+04
	156 939.500	168 490.430	1.053E-01	4	2	2.386E-03	2.720E-01	4.251E+05
	156 829.750	168 490.430	1.063E-01	2	2	4.818E-03	2.720E-01	4.373E+05
$y^4D^o \rightarrow h^4P^o$	0.2878	0.1369	1.509E-01	20	12	4.008E-02	1.594E+01	1.221E+07
	157 558.770	174 098.100	1.507E-01	8	6	4.004E-02	6.377E+00	9.739E+06
	157 173.690	174 098.100	1.542E-01	6	6	1.229E-02	1.435E+00	2.348E+06
	156 939.500	174 098.100	1.564E-01	4	6	2.078E-03	1.594E-01	2.722E+05
	157 173.690	173 595.770	1.496E-01	6	4	2.782E-02	3.348E+00	7.503E+06
	156 939.500	173 595.770	1.518E-01	4	4	2.151E-02	1.701E+00	3.982E+06
	156 829.750	173 595.770	1.528E-01	2	4	6.767E-03	2.657E-01	6.345E+05
	156 939.500	173 316.830	1.493E-01	4	2	1.653E-02	1.329E+00	5.919E+06
	156 829.750	173 316.830	1.503E-01	2	2	3.328E-02	1.329E+00	6.039E+06
$y^4D^o \rightarrow i^4P^o$	0.2878	0.1263	1.615E-01	20	12	1.206E-03	4.482E-01	4.211E+05
	157 558.770	174 892.750	1.579E-01	8	6	1.180E-03	1.793E-01	3.150E+05
	157 173.690	174 892.750	1.614E-01	6	6	3.617E-04	4.034E-02	7.568E+04
	156 939.500	174 892.750	1.636E-01	4	6	6.111E-05	4.482E-03	8.758E+03
	157 173.690	175 019.780	1.626E-01	6	4	8.503E-04	9.412E-02	2.708E+05
	156 939.500	175 019.780	1.648E-01	4	4	6.566E-04	4.781E-02	1.432E+05
	156 829.750	175 019.780	1.658E-01	2	4	2.064E-04	7.470E-03	2.279E+04
	156 939.500	175 083.510	1.654E-01	4	2	5.148E-04	3.735E-02	2.263E+05
	156 829.750	175 083.510	1.664E-01	2	2	1.036E-03	3.735E-02	2.304E+05

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^4D^\circ \rightarrow j^4P^\circ$	0.2878	0.0905	1.972E-01	20	12	4.921E-04	1.497E-01	2.563E+05
	157 558.770	178 848.960	1.940E-01	8	6	4.840E-04	5.988E-02	1.951E+05
	157 173.690	178 848.960	1.975E-01	6	6	1.478E-04	1.347E-02	4.631E+04
	156 939.500	178 848.960	1.997E-01	4	6	2.491E-05	1.497E-03	5.320E+03
	157 173.690	178 915.200	1.981E-01	6	4	3.460E-04	3.144E-02	1.636E+05
	156 939.500	178 915.200	2.003E-01	4	4	2.665E-04	1.597E-02	8.589E+04
	156 829.750	178 915.200	2.013E-01	2	4	8.370E-05	2.495E-03	1.362E+04
	156 939.500	178 969.320	2.008E-01	4	2	2.087E-04	1.247E-02	1.352E+05
	156 829.750	178 969.320	2.018E-01	2	2	4.196E-04	1.247E-02	1.372E+05
$y^4D^\circ \rightarrow c^4D^\circ$	0.2878	0.1950	9.274E-02	20	20	1.850E-01	1.197E+02	1.278E+07
	157 558.770	167 575.230	9.130E-02	8	8	1.561E-01	4.105E+01	1.045E+07
	157 558.770	167 364.980	8.930E-02	8	6	2.538E-02	6.821E+00	2.168E+06
	157 173.690	167 575.230	9.480E-02	6	8	3.592E-02	6.821E+00	1.945E+06
	157 173.690	167 364.980	9.280E-02	6	6	1.061E-01	2.058E+01	7.340E+06
	157 173.690	167 291.840	9.220E-02	6	4	4.291E-02	8.377E+00	4.395E+06
	156 939.500	167 364.980	9.500E-02	4	6	6.632E-02	8.377E+00	3.205E+06
	156 939.500	167 291.840	9.440E-02	4	4	7.531E-02	9.573E+00	5.391E+06
	156 939.500	167 254.840	9.400E-02	4	2	4.687E-02	5.983E+00	6.653E+06
	156 829.750	167 291.840	9.540E-02	2	4	9.514E-02	5.983E+00	3.477E+06
	156 829.750	167 254.840	9.500E-02	2	2	9.474E-02	5.983E+00	6.868E+06
$y^4D^\circ \rightarrow d^4D^\circ$ *	0.2878	0.1319	1.558E-01	20	20	2.284E-02	8.793E+00	4.455E+06
		*		8	8	1.958E-02	3.016E+00	3.816E+06
	157 558.770	174 360.920	1.531E-01	8	6	3.197E-03	5.012E-01	8.026E+05
		*		6	8	4.350E-03	5.012E-01	6.397E+05
	157 173.690	174 360.920	1.566E-01	6	6	1.316E-02	1.512E+00	2.592E+06
	157 173.690	174 329.310	1.563E-01	6	4	5.345E-03	6.155E-01	1.573E+06
	156 939.500	174 360.920	1.588E-01	4	6	8.145E-03	6.155E-01	1.100E+06
	156 939.500	174 329.310	1.585E-01	4	4	9.291E-03	7.034E-01	1.875E+06
		*		4	2	5.710E-03	4.396E-01	2.228E+06
	156 829.750	174 329.310	1.595E-01	2	4	1.169E-02	4.396E-01	1.194E+06
		*		2	2	1.142E-02	4.396E-01	2.228E+06
$y^4D^\circ \rightarrow e^4D^\circ$ *	0.2878	0.0955	1.923E-01	20	20	7.468E-03	2.331E+00	2.217E+06
		*		8	8	6.401E-03	7.994E-01	1.899E+06
	157 558.770	178 344.360	1.894E-01	8	6	1.048E-03	1.328E-01	4.028E+05
		*		6	8	1.422E-03	1.328E-01	3.183E+05
	157 173.690	178 344.360	1.929E-01	6	6	4.296E-03	4.009E-01	1.284E+06
		*		6	4	1.742E-03	1.631E-01	7.760E+05
	156 939.500	178 344.360	1.951E-01	4	6	2.652E-03	1.631E-01	5.406E+05
		*		4	4	2.987E-03	1.864E-01	8.869E+05
		*		4	2	1.867E-03	1.165E-01	1.109E+06
		*		2	4	3.734E-03	1.165E-01	5.543E+05
		*		2	2	3.734E-03	1.165E-01	1.109E+06
$y^4D^\circ \rightarrow c^4F^\circ$	0.2878	0.1993	8.844E-02	20	28	1.070E+00	7.259E+02	4.802E+07
	157 558.770	167 269.150	8.850E-02	8	10	9.560E-01	2.593E+02	4.811E+07
	157 558.770	166 918.270	8.530E-02	8	8	1.050E-01	2.956E+01	6.139E+06
	157 558.770	166 709.270	8.340E-02	8	6	5.225E-03	1.504E+00	3.892E+05
	157 173.690	166 918.270	8.880E-02	6	8	8.774E-01	1.778E+02	4.168E+07
	157 173.690	166 709.270	8.690E-02	6	6	1.827E-01	3.785E+01	1.108E+07
	157 173.690	166 591.080	8.580E-02	6	4	9.886E-03	2.074E+00	8.769E+05
	156 939.500	166 709.270	8.910E-02	4	6	8.662E-01	1.167E+02	3.682E+07
	156 939.500	166 591.080	8.800E-02	4	4	2.129E-01	2.904E+01	1.324E+07
	156 829.750	166 591.080	8.900E-02	2	4	1.077E+00	7.259E+01	3.425E+07
$y^4D^\circ \rightarrow d^4F^\circ$ *	0.2878	0.1303	1.575E-01	20	28	1.168E-01	4.448E+01	1.662E+07
	157 558.770	174 529.270	1.546E-01	8	10	1.023E-01	1.589E+01	1.572E+07
		*		8	8	1.191E-02	1.811E+00	2.386E+06
		*		8	6	5.957E-04	9.214E-02	1.536E+05
		*		6	8	9.531E-02	1.090E+01	1.423E+07
		*		6	6	2.033E-02	2.319E+00	4.067E+06
		*		6	4	1.112E-03	1.271E-01	3.323E+05
		*		4	6	9.340E-02	7.149E+00	1.230E+07
		*		4	4	2.335E-02	1.779E+00	4.652E+06
		*		2	4	1.168E-01	4.448E+00	1.163E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$a^2S^{\circ} \rightarrow y^2P^{\circ}$	0.6291	0.5055	1.237E-01	2	6	2.529E-03	1.227E-01	1.036E+05
	119 783.770	133 399.970	1.240E-01	2	4	1.690E-03	8.178E-02	1.044E+05
	119 783.770	133 268.680	1.228E-01	2	2	8.369E-04	4.089E-02	1.014E+05
$a^2S^{\circ} \rightarrow x^2P^{\circ}$	0.6291	0.4123	2.168E-01	2	6	4.501E-02	1.245E+00	5.666E+06
	119 783.770	143 623.560	2.172E-01	2	4	3.006E-02	8.303E-01	5.694E+06
	119 783.770	143 488.950	2.160E-01	2	2	1.494E-02	4.151E-01	5.601E+06
$a^2S^{\circ} \rightarrow w^2P^{\circ}$	0.6291	0.2969	3.322E-01	2	6	2.308E-03	4.168E-02	6.819E+05
	119 783.770	156 276.830	3.325E-01	2	4	1.540E-03	2.778E-02	6.836E+05
	119 783.770	156 167.040	3.315E-01	2	2	7.675E-04	1.389E-02	6.775E+05
$b^2S^{\circ} \rightarrow x^2P^{\circ}$	0.4784	0.4123	6.607E-02	2	6	1.992E-02	1.809E+00	2.328E+05
	136 328.790	143 623.560	6.650E-02	2	4	1.337E-02	1.206E+00	2.374E+05
	136 328.790	143 488.950	6.530E-02	2	2	6.563E-03	6.030E-01	2.248E+05
$b^2S^{\circ} \rightarrow w^2P^{\circ}$	0.4784	0.2969	1.814E-01	2	6	8.580E-01	2.837E+01	7.563E+07
	136 328.790	156 276.830	1.818E-01	2	4	5.731E-01	1.891E+01	7.607E+07
	136 328.790	156 167.040	1.808E-01	2	2	2.850E-01	9.457E+00	7.483E+07
$c^2S^{\circ} \rightarrow w^2P^{\circ}$	0.3387	0.2969	4.181E-02	2	6	2.496E-02	3.582E+00	1.168E+05
	151 651.720	156 276.830	4.210E-02	2	4	1.675E-02	2.388E+00	1.193E+05
	151 651.720	156 167.040	4.110E-02	2	2	8.178E-03	1.194E+00	1.110E+05
$a^2P^{\circ} \rightarrow z^2S^{\circ}$	0.7571	0.5772	1.799E-01	6	2	4.495E-02	4.498E+00	3.504E+07
	105 599.060	125 485.290	1.812E-01	4	2	4.529E-02	2.999E+00	2.389E+07
	106 044.240	125 485.290	1.772E-01	2	2	4.427E-02	1.499E+00	1.116E+07
$a^2P^{\circ} \rightarrow y^2P^{\circ}$	0.7571	0.5055	2.516E-01	6	6	4.885E-02	3.495E+00	2.484E+07
	105 599.060	133 399.970	2.533E-01	4	4	4.099E-02	1.942E+00	2.113E+07
	105 599.060	133 268.680	2.521E-01	4	2	8.159E-03	3.884E-01	8.331E+06
	106 044.240	133 399.970	2.493E-01	2	4	1.613E-02	3.884E-01	4.025E+06
	106 044.240	133 268.680	2.480E-01	2	2	3.211E-02	7.767E-01	1.587E+07
$a^2P^{\circ} \rightarrow x^2P^{\circ}$	0.7571	0.4123	3.447E-01	6	6	1.604E-03	8.376E-02	1.531E+06
	105 599.060	143 623.560	3.465E-01	4	4	1.344E-03	4.654E-02	1.296E+06
	105 599.060	143 488.950	3.453E-01	4	2	2.678E-04	9.307E-03	5.130E+05
	106 044.240	143 623.560	3.424E-01	2	4	5.312E-04	9.307E-03	2.502E+05
	106 044.240	143 488.950	3.413E-01	2	2	1.059E-03	1.861E-02	9.903E+05
$a^2P^{\circ} \rightarrow w^2P^{\circ}$	0.7571	0.2969	4.601E-01	6	6	2.065E-04	8.080E-03	3.512E+05
	105 599.060	156 276.830	4.618E-01	4	4	1.727E-04	4.489E-03	2.959E+05
	105 599.060	156 167.040	4.608E-01	4	2	3.447E-05	8.977E-04	1.176E+05
	106 044.240	156 276.830	4.578E-01	2	4	6.849E-05	8.977E-04	5.764E+04
	106 044.240	156 167.040	4.567E-01	2	2	1.367E-04	1.795E-03	2.290E+05
$a^2P^{\circ} \rightarrow y^2D^{\circ}$	0.7571	0.5272	2.298E-01	6	10	3.050E-03	2.389E-01	7.764E+05
	105 599.060	131 187.190	2.332E-01	4	6	2.785E-03	1.433E-01	8.111E+05
	105 599.060	130 641.110	2.282E-01	4	4	3.028E-04	1.592E-02	1.267E+05
	106 044.240	130 641.110	2.242E-01	2	4	2.974E-03	7.962E-02	6.002E+05
$a^2P^{\circ} \rightarrow x^2D^{\circ}$	0.7571	0.4383	3.187E-01	6	10	6.201E-03	3.502E-01	3.036E+06
	105 599.060	140 708.890	3.199E-01	4	6	5.601E-03	2.101E-01	3.070E+06
	105 599.060	140 750.340	3.203E-01	4	4	6.231E-04	2.334E-02	5.135E+05
	106 044.240	140 750.340	3.163E-01	2	4	6.152E-03	1.167E-01	2.471E+06
$a^2P^{\circ} \rightarrow w^2D^{\circ}$	0.7571	0.2762	4.809E-01	6	10	8.322E-03	3.115E-01	9.274E+06
	105 599.060	158 715.460	4.840E-01	4	6	7.539E-03	1.869E-01	9.457E+06
	105 599.060	158 215.590	4.795E-01	4	4	8.299E-04	2.077E-02	1.533E+06
	106 044.240	158 215.590	4.755E-01	2	4	8.229E-03	1.038E-01	7.470E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$b^2P^\circ \rightarrow z^2S^\circ$	0.6884	0.5772	1.112E-01	6	2	8.862E-02	1.435E+01	2.639E+07
	113 461.540	125 485.290	1.096E-01	4	2	8.738E-02	9.567E+00	1.686E+07
	112 937.570	125 485.290	1.143E-01	2	2	9.112E-02	4.783E+00	9.562E+06
$b^2P^\circ \rightarrow y^2P^\circ$	0.6884	0.5055	1.829E-01	6	6	3.145E-01	3.095E+01	8.448E+07
	113 461.540	133 399.970	1.817E-01	4	4	2.604E-01	1.719E+01	6.904E+07
	113 461.540	133 268.680	1.805E-01	4	2	5.173E-02	3.439E+00	2.707E+07
	112 937.570	133 399.970	1.864E-01	2	4	1.068E-01	3.439E+00	1.491E+07
	112 937.570	133 268.680	1.852E-01	2	2	2.123E-01	6.878E+00	5.849E+07
$b^2P^\circ \rightarrow x^2P^\circ$	0.6884	0.4123	2.760E-01	6	6	3.244E-02	2.115E+00	1.985E+07
	113 461.540	143 623.560	2.749E-01	4	4	2.692E-02	1.175E+00	1.634E+07
	113 461.540	143 488.950	2.737E-01	4	2	5.361E-03	2.350E-01	6.451E+06
	112 937.570	143 623.560	2.796E-01	2	4	1.095E-02	2.350E-01	3.439E+06
	112 937.570	143 488.950	2.784E-01	2	2	2.181E-02	4.701E-01	1.358E+07
$b^2P^\circ \rightarrow w^2P^\circ$	0.6884	0.2969	3.914E-01	6	6	9.052E-04	4.162E-02	1.114E+06
	113 461.540	156 276.830	3.902E-01	4	4	7.519E-04	2.312E-02	9.196E+05
	113 461.540	156 167.040	3.892E-01	4	2	1.500E-04	4.625E-03	3.650E+05
	112 937.570	156 276.830	3.949E-01	2	4	3.044E-04	4.625E-03	1.906E+05
	112 937.570	156 167.040	3.939E-01	2	2	6.073E-04	9.250E-03	7.568E+05
$b^2P^\circ \rightarrow y^2D^\circ$	0.6884	0.5272	1.611E-01	6	10	5.073E-01	5.667E+01	6.348E+07
	113 461.540	131 187.190	1.616E-01	4	6	4.579E-01	3.400E+01	6.404E+07
	113 461.540	130 641.110	1.566E-01	4	4	4.931E-02	3.778E+00	9.712E+06
	112 937.570	130 641.110	1.613E-01	2	4	5.079E-01	1.889E+01	5.307E+07
$b^2P^\circ \rightarrow x^2D^\circ$	0.6884	0.4383	2.500E-01	6	10	7.961E-02	5.731E+00	2.399E+07
	113 461.540	140 708.890	2.483E-01	4	6	7.115E-02	3.439E+00	2.349E+07
	113 461.540	140 750.340	2.487E-01	4	4	7.919E-03	3.821E-01	3.934E+06
	112 937.570	140 750.340	2.534E-01	2	4	8.068E-02	1.910E+00	2.081E+07
$b^2P^\circ \rightarrow w^2D^\circ$	0.6884	0.2762	4.122E-01	6	10	5.218E-03	2.279E-01	4.272E+06
	113 461.540	158 715.460	4.124E-01	4	6	4.699E-03	1.367E-01	4.280E+06
	113 461.540	158 215.590	4.079E-01	4	4	5.164E-04	1.519E-02	6.902E+05
	112 937.570	158 215.590	4.126E-01	2	4	5.224E-03	7.597E-02	3.572E+06
$c^2P^\circ \rightarrow x^2P^\circ$	0.4453	0.4123	3.298E-02	6	6	5.202E-02	2.839E+01	4.545E+05
	140 016.770	143 623.560	3.290E-02	4	4	4.324E-02	1.577E+01	3.760E+05
	140 016.770	143 488.950	3.170E-02	4	2	8.333E-03	3.154E+00	1.345E+05
	139 844.990	143 623.560	3.440E-02	2	4	1.809E-02	3.154E+00	8.595E+04
	139 844.990	143 488.950	3.320E-02	2	2	3.491E-02	6.309E+00	3.091E+05
$c^2P^\circ \rightarrow w^2P^\circ$	0.4453	0.2969	1.484E-01	6	6	1.217E-03	1.477E-01	2.152E+05
	140 016.770	156 276.830	1.482E-01	4	4	1.013E-03	8.203E-02	1.787E+05
	140 016.770	156 167.040	1.472E-01	4	2	2.013E-04	1.641E-02	7.005E+04
	139 844.990	156 276.830	1.497E-01	2	4	4.093E-04	1.641E-02	3.684E+04
	139 844.990	156 167.040	1.487E-01	2	2	8.132E-04	3.281E-02	1.444E+05
$c^2P^\circ \rightarrow x^2D^\circ$	0.4453	0.4383	6.980E-03	6	10	2.004E-03	5.167E+00	4.705E+02
	140 016.770	140 708.890	6.300E-03	4	6	1.628E-03	3.100E+00	3.460E+02
	140 016.770	140 750.340	6.700E-03	4	4	1.923E-04	3.445E-01	6.935E+01
	139 844.990	140 750.340	8.200E-03	2	4	2.354E-03	1.722E+00	6.357E+02
$c^2P^\circ \rightarrow w^2D^\circ$	0.4453	0.2762	1.691E-01	6	10	1.203E-02	1.280E+00	1.657E+06
	140 016.770	158 715.460	1.704E-01	4	6	1.091E-02	7.681E-01	1.696E+06
	140 016.770	158 215.590	1.659E-01	4	4	1.180E-03	8.534E-02	2.608E+05
	139 844.990	158 215.590	1.674E-01	2	4	1.190E-02	4.267E-01	1.340E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$d^2P^{\circ} \rightarrow w^2P^{\circ}$	0.3936	0.2969	9.669E-02	6	6	2.182E-02	4.062E+00	1.638E+06
	145 505.740	156 276.830	9.820E-02	4	4	1.847E-02	2.257E+00	1.430E+06
	145 505.740	156 167.040	9.720E-02	4	2	3.656E-03	4.513E-01	5.548E+05
	145 877.660	156 276.830	9.480E-02	2	4	7.131E-03	4.513E-01	2.574E+05
	145 877.660	156 167.040	9.380E-02	2	2	1.411E-02	9.026E-01	9.972E+05
$d^2P^{\circ} \rightarrow w^2D^{\circ}$	0.3936	0.2762	1.174E-01	6	10	3.439E-02	5.272E+00	2.285E+06
	145 505.740	158 715.460	1.204E-01	4	6	3.173E-02	3.163E+00	2.463E+06
	145 505.740	158 215.590	1.159E-01	4	4	3.394E-03	3.514E-01	3.662E+05
	145 877.660	158 215.590	1.125E-01	2	4	3.295E-02	1.757E+00	1.675E+06
$e^2P^{\circ} \rightarrow w^2P^{\circ}$	0.3380	0.2969	4.105E-02	6	6	2.535E-02	1.112E+01	3.432E+05
	151 910.830	156 276.830	3.980E-02	4	4	2.048E-02	6.175E+00	2.606E+05
	151 910.830	156 167.040	3.880E-02	4	2	3.993E-03	1.235E+00	9.658E+04
	151 383.810	156 276.830	4.460E-02	2	4	9.181E-03	1.235E+00	7.334E+04
	151 383.810	156 167.040	4.360E-02	2	2	1.795E-02	2.470E+00	2.741E+05
$e^2P^{\circ} \rightarrow w^2D^{\circ}$	0.3380	0.2762	6.179E-02	6	10	8.305E-01	2.419E+02	1.528E+07
	151 910.830	158 715.460	6.200E-02	4	6	7.500E-01	1.452E+02	1.544E+07
	151 910.830	158 215.590	5.750E-02	4	4	7.729E-02	1.613E+01	2.053E+06
	151 383.810	158 215.590	6.230E-02	2	4	8.374E-01	8.065E+01	1.305E+07
$a^2D^{\circ} \rightarrow y^2P^{\circ}$	0.8285	0.5055	3.230E-01	10	6	5.806E-03	5.392E-01	8.110E+06
	97 918.860	133 399.970	3.233E-01	6	4	5.810E-03	3.235E-01	7.317E+06
	97 890.740	133 399.970	3.236E-01	4	4	9.691E-04	3.594E-02	8.149E+05
	97 890.740	133 268.680	3.224E-01	4	2	4.828E-03	1.797E-01	8.059E+06
$a^2D^{\circ} \rightarrow x^2P^{\circ}$	0.8285	0.4123	4.162E-01	10	6	1.561E-02	1.125E+00	3.619E+07
	97 918.860	143 623.560	4.165E-01	6	4	1.562E-02	6.751E-01	3.265E+07
	97 890.740	143 623.560	4.168E-01	4	4	2.605E-03	7.501E-02	3.634E+06
	97 890.740	143 488.950	4.156E-01	4	2	1.299E-02	3.750E-01	3.603E+07
$a^2D^{\circ} \rightarrow w^2P^{\circ}$	0.8285	0.2969	5.316E-01	10	6	3.318E-03	1.873E-01	1.255E+07
	97 918.860	156 276.830	5.318E-01	6	4	3.320E-03	1.124E-01	1.131E+07
	97 890.740	156 276.830	5.321E-01	4	4	5.535E-04	1.248E-02	1.259E+06
	97 890.740	156 167.040	5.311E-01	4	2	2.762E-03	6.242E-02	1.251E+07
$a^2D^{\circ} \rightarrow y^2D^{\circ}$	0.8285	0.5272	3.013E-01	10	10	3.243E-04	3.229E-02	2.364E+05
	97 918.860	131 187.190	3.032E-01	6	6	3.046E-04	1.808E-02	2.249E+05
	97 918.860	130 641.110	2.982E-01	6	4	2.140E-05	1.292E-03	2.293E+04
	97 890.740	131 187.190	3.035E-01	4	6	3.266E-05	1.292E-03	1.610E+04
	97 890.740	130 641.110	2.985E-01	4	4	2.891E-04	1.162E-02	2.068E+05
$a^2D^{\circ} \rightarrow x^2D^{\circ}$	0.8285	0.4383	3.902E-01	10	10	1.701E-02	1.308E+00	2.081E+07
	97 918.860	140 708.890	3.899E-01	6	6	1.587E-02	7.326E-01	1.938E+07
	97 918.860	140 750.340	3.903E-01	6	4	1.135E-03	5.233E-02	2.082E+06
	97 890.740	140 708.890	3.902E-01	4	6	1.701E-03	5.233E-02	1.387E+06
	97 890.740	140 750.340	3.906E-01	4	4	1.533E-02	4.709E-01	1.878E+07
$a^2D^{\circ} \rightarrow w^2D^{\circ}$	0.8285	0.2762	5.523E-01	10	10	3.976E-04	2.159E-02	9.741E+05
	97 918.860	158 715.460	5.540E-01	6	6	3.722E-04	1.209E-02	9.175E+05
	97 918.860	158 215.590	5.495E-01	6	4	2.637E-05	8.638E-04	9.593E+04
	97 890.740	158 715.460	5.543E-01	4	6	3.990E-05	8.638E-04	6.563E+04
	97 890.740	158 215.590	5.498E-01	4	4	3.561E-04	7.774E-03	8.646E+05
$a^2D^{\circ} \rightarrow z^2F^{\circ}$	0.8285	0.4424	3.861E-01	10	14	5.663E-03	4.400E-01	4.844E+06
	97 918.860	140 319.230	3.864E-01	6	8	5.397E-03	2.514E-01	4.854E+06
	97 918.860	140 230.100	3.856E-01	6	6	2.693E-04	1.257E-02	3.216E+05
	97 890.740	140 230.100	3.859E-01	4	6	5.659E-03	1.760E-01	4.512E+06



Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$a^2D^{\circ} \rightarrow y^2F^{\circ}$	0.8285	0.1856	6.429E-01	10	14	3.644E-04	1.700E-02	8.641E+05
	97 918.860	168 473.480	6.429E-01	6	8	3.470E-04	9.716E-03	8.640E+05
	97 918.860	168 443.140	6.427E-01	6	6	1.735E-05	4.858E-04	5.755E+04
	97 890.740	168 443.140	6.429E-01	4	6	3.644E-04	6.801E-03	8.066E+05
$b^2D^{\circ} \rightarrow y^2P^{\circ}$	0.6132	0.5055	1.078E-01	10	6	1.586E-02	4.414E+00	2.466E+06
	121 530.020	133 399.970	1.081E-01	6	4	1.591E-02	2.648E+00	2.239E+06
	121 528.720	133 399.970	1.081E-01	4	4	2.651E-03	2.943E-01	2.488E+05
	121 528.720	133 268.680	1.069E-01	4	2	1.311E-02	1.471E+00	2.406E+06
$b^2D^{\circ} \rightarrow x^2P^{\circ}$	0.6132	0.4123	2.009E-01	10	6	1.706E-01	2.547E+01	9.220E+07
	121 530.020	143 623.560	2.013E-01	6	4	1.709E-01	1.528E+01	8.344E+07
	121 528.720	143 623.560	2.013E-01	4	4	2.849E-02	1.698E+00	9.272E+06
	121 528.720	143 488.950	2.001E-01	4	2	1.416E-01	8.491E+00	9.107E+07
$b^2D^{\circ} \rightarrow w^2P^{\circ}$	0.6132	0.2969	3.163E-01	10	6	4.107E-03	3.895E-01	5.501E+06
	121 530.020	156 276.830	3.166E-01	6	4	4.111E-03	2.337E-01	4.964E+06
	121 528.720	156 276.830	3.166E-01	4	4	6.851E-04	2.597E-02	5.516E+05
	121 528.720	156 167.040	3.156E-01	4	2	3.415E-03	1.298E-01	5.464E+06
$b^2D^{\circ} \rightarrow y^2D^{\circ}$	0.6132	0.5272	8.602E-02	10	10	2.472E-02	8.621E+00	1.469E+06
	121 530.020	131 187.190	8.800E-02	6	6	2.360E-02	4.828E+00	1.468E+06
	121 530.020	130 641.110	8.300E-02	6	4	1.590E-03	3.449E-01	1.320E+05
	121 528.720	131 187.190	8.800E-02	4	6	2.529E-03	3.449E-01	1.049E+05
	121 528.720	130 641.110	8.300E-02	4	4	2.147E-02	3.104E+00	1.188E+06
$b^2D^{\circ} \rightarrow x^2D^{\circ}$	0.6132	0.4383	1.749E-01	10	10	3.508E-01	6.016E+01	8.622E+07
	121 530.020	140 708.890	1.747E-01	6	6	3.270E-01	3.369E+01	8.016E+07
	121 530.020	140 750.340	1.751E-01	6	4	2.341E-02	2.406E+00	8.647E+06
	121 528.720	140 708.890	1.747E-01	4	6	3.503E-02	2.406E+00	5.725E+06
	121 528.720	140 750.340	1.751E-01	4	4	3.160E-01	2.166E+01	7.783E+07
$b^2D^{\circ} \rightarrow w^2D^{\circ}$	0.6132	0.2762	3.370E-01	10	10	8.355E-03	7.437E-01	7.623E+06
	121 530.020	158 715.460	3.388E-01	6	6	7.838E-03	4.164E-01	7.227E+06
	121 530.020	158 215.590	3.343E-01	6	4	5.525E-04	2.975E-02	7.439E+05
	121 528.720	158 715.460	3.388E-01	4	6	8.398E-04	2.975E-02	5.162E+05
	121 528.720	158 215.590	3.343E-01	4	4	7.458E-03	2.677E-01	6.695E+06
$b^2D^{\circ} \rightarrow z^2F^{\circ}$	0.6132	0.4424	1.709E-01	10	14	4.751E-01	8.341E+01	7.959E+07
	121 530.020	140 319.230	1.712E-01	6	8	4.533E-01	4.766E+01	8.004E+07
	121 530.020	140 230.100	1.704E-01	6	6	2.256E-02	2.383E+00	5.261E+06
	121 528.720	140 230.100	1.704E-01	4	6	4.737E-01	3.336E+01	7.366E+07
$b^2D^{\circ} \rightarrow y^2F^{\circ}$	0.6132	0.1856	4.277E-01	10	14	1.388E-03	9.733E-02	1.456E+06
	121 530.020	168 473.480	4.277E-01	6	8	1.322E-03	5.562E-02	1.456E+06
	121 530.020	168 443.140	4.275E-01	6	6	6.605E-05	2.781E-03	9.695E+04
	121 528.720	168 443.140	4.275E-01	4	6	1.387E-03	3.893E-02	1.357E+06
$c^2D^{\circ} \rightarrow x^2P^{\circ}$	0.5029	0.4123	9.063E-02	10	6	2.318E-02	7.673E+00	2.549E+06
	133 814.840	143 623.560	8.940E-02	6	4	2.287E-02	4.604E+00	2.202E+06
	133 360.860	143 623.560	9.350E-02	4	4	3.986E-03	5.115E-01	2.799E+05
	133 360.860	143 488.950	9.230E-02	4	2	1.967E-02	2.558E+00	2.692E+06
$c^2D^{\circ} \rightarrow w^2P^{\circ}$	0.5029	0.2969	2.060E-01	10	6	5.409E-03	7.877E-01	3.073E+06
	133 814.840	156 276.830	2.047E-01	6	4	5.375E-03	4.726E-01	2.713E+06
	133 360.860	156 276.830	2.088E-01	4	4	9.137E-04	5.251E-02	3.200E+05
	133 360.860	156 167.040	2.078E-01	4	2	4.547E-03	2.626E-01	3.154E+06
$c^2D^{\circ} \rightarrow x^2D^{\circ}$	0.5029	0.4383	6.463E-02	10	10	5.104E-03	2.369E+00	1.713E+05
	133 814.840	140 708.890	6.280E-02	6	6	4.629E-03	1.327E+00	1.466E+05
	133 814.840	140 750.340	6.320E-02	6	4	3.328E-04	9.477E-02	1.601E+04
	133 360.860	140 708.890	6.690E-02	4	6	5.284E-04	9.477E-02	1.266E+04
	133 360.860	140 750.340	6.730E-02	4	4	4.784E-03	8.530E-01	1.740E+05

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$c^2D^{\circ} \rightarrow w^2D^{\circ}$	0.5029	0.2762	2.267E-01	10	10	5.689E-03	7.527E-01	2.349E+06
	133 814.840	158 715.460	2.269E-01	6	6	5.313E-03	4.215E-01	2.197E+06
	133 814.840	158 215.590	2.224E-01	6	4	3.720E-04	3.011E-02	2.217E+05
	133 360.860	158 715.460	2.310E-01	4	6	5.796E-04	3.011E-02	1.656E+05
	133 360.860	158 215.590	2.265E-01	4	4	5.115E-03	2.710E-01	2.108E+06
$c^2D^{\circ} \rightarrow z^2F^{\circ}$	0.5029	0.4424	6.058E-02	10	14	1.762E-03	8.728E-01	3.711E+04
	133 814.840	140 319.230	5.930E-02	6	8	1.643E-03	4.988E-01	3.481E+04
	133 814.840	140 230.100	5.850E-02	6	6	8.105E-05	2.494E-02	2.228E+03
	133 360.860	140 230.100	6.260E-02	4	6	1.821E-03	3.491E-01	3.822E+04
$c^2D^{\circ} \rightarrow y^2F^{\circ}$	0.5029	0.1856	3.174E-01	10	14	1.032E-03	9.755E-02	5.963E+05
	133 814.840	168 473.480	3.158E-01	6	8	9.779E-04	5.574E-02	5.875E+05
	133 814.840	168 443.140	3.156E-01	6	6	4.887E-05	2.787E-03	3.909E+04
	133 360.860	168 443.140	3.197E-01	4	6	1.040E-03	3.902E-02	5.689E+05
$d^2D^{\circ} \rightarrow w^2P^{\circ}$	0.4079	0.2969	1.110E-01	10	6	3.171E-02	8.571E+00	5.227E+06
	144 009.420	156 276.830	1.118E-01	6	4	3.194E-02	5.143E+00	4.810E+06
	144 142.160	156 276.830	1.106E-01	4	4	5.267E-03	5.714E-01	5.175E+05
	144 142.160	156 167.040	1.096E-01	4	2	2.610E-02	2.857E+00	5.036E+06
$d^2D^{\circ} \rightarrow w^2D^{\circ}$	0.4079	0.2762	1.317E-01	10	10	4.828E-04	1.100E-01	6.727E+04
	144 009.420	158 715.460	1.340E-01	6	6	4.585E-04	6.159E-02	6.613E+04
	144 009.420	158 215.590	1.295E-01	6	4	3.165E-05	4.399E-03	6.395E+03
	144 142.160	158 715.460	1.328E-01	4	6	4.869E-05	4.399E-03	4.598E+03
	144 142.160	158 215.590	1.283E-01	4	4	4.233E-04	3.959E-02	5.597E+04
$d^2D^{\circ} \rightarrow y^2F^{\circ}$	0.4079	0.1856	2.223E-01	10	14	1.399E-02	1.887E+00	3.966E+06
	144 009.420	168 473.480	2.229E-01	6	8	1.335E-02	1.078E+00	3.997E+06
	144 009.420	168 443.140	2.227E-01	6	6	6.671E-04	5.392E-02	2.657E+05
	144 142.160	168 443.140	2.215E-01	4	6	1.393E-02	7.548E-01	3.660E+06
$e^2D^{\circ} \rightarrow w^2P^{\circ}$	0.3639	0.2969	6.696E-02	10	6	7.154E-02	3.205E+01	4.294E+06
	148 886.570	156 276.830	6.730E-02	6	4	7.190E-02	1.923E+01	3.924E+06
	148 900.910	156 276.830	6.720E-02	4	4	1.197E-02	2.137E+00	4.340E+05
	148 900.910	156 167.040	6.620E-02	4	2	5.894E-02	1.068E+01	4.149E+06
$e^2D^{\circ} \rightarrow w^2D^{\circ}$	0.3639	0.2762	8.769E-02	10	10	4.617E-02	1.580E+01	2.852E+06
	148 886.570	158 715.460	8.950E-02	6	6	4.398E-02	8.845E+00	2.830E+06
	148 886.570	158 215.590	8.500E-02	6	4	2.984E-03	6.318E-01	2.597E+05
	148 900.910	158 715.460	8.940E-02	4	6	4.707E-03	6.318E-01	2.014E+05
	148 900.910	158 215.590	8.490E-02	4	4	4.023E-02	5.686E+00	2.329E+06
$e^2D^{\circ} \rightarrow y^2F^{\circ}$	0.3639	0.1856	1.783E-01	10	14	4.233E-03	7.121E-01	7.721E+05
	148 886.570	168 473.480	1.784E-01	6	8	4.033E-03	4.069E-01	7.732E+05
	148 886.570	168 443.140	1.782E-01	6	6	2.014E-04	2.034E-02	5.137E+04
	148 900.910	168 443.140	1.781E-01	4	6	4.227E-03	2.848E-01	7.180E+05
$f^2D^{\circ} \rightarrow y^2F^{\circ}$	0.2673	0.1856	8.171E-02	10	14	8.192E-03	3.008E+00	3.138E+05
	159 492.830	168 473.480	8.180E-02	6	8	7.810E-03	1.719E+00	3.148E+05
	159 492.830	168 443.140	8.160E-02	6	6	3.896E-04	8.593E-02	2.084E+04
	159 495.940	168 443.140	8.160E-02	4	6	8.181E-03	1.203E+00	2.917E+05
$g^2D^{\circ} \rightarrow y^2F^{\circ}$	0.2469	0.1856	6.129E-02	10	14	7.049E-01	3.450E+02	1.519E+07
	161 733.100	168 473.480	6.140E-02	6	8	6.726E-01	1.972E+02	1.527E+07
	161 733.100	168 443.140	6.120E-02	6	6	3.352E-02	9.859E+00	1.008E+06
	161 737.990	168 443.140	6.110E-02	4	6	7.027E-01	1.380E+02	1.405E+07

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
<b><math>h^2D^{\circ} \rightarrow y^2F^{\circ}</math></b>	0.1944	0.1856	8.818E-03	10	14	1.286E-02	4.376E+01	5.739E+03
	167 506.390	168 473.480	8.800E-03	6	8	1.223E-02	2.501E+01	5.704E+03
	167 506.390	168 443.140	8.600E-03	6	6	5.974E-04	1.250E+00	3.549E+02
	167 472.420	168 443.140	8.900E-03	4	6	1.298E-02	1.751E+01	5.507E+03
<b><math>a^2F^{\circ} \rightarrow y^2D^{\circ}</math></b>	0.6720	0.5272	1.448E-01	14	10	8.468E-02	2.456E+01	1.996E+07
	115 285.610	131 187.190	1.449E-01	8	6	8.474E-02	1.404E+01	1.905E+07
	114 804.370	131 187.190	1.493E-01	6	6	5.821E-03	7.018E-01	1.042E+06
	114 804.370	130 641.110	1.443E-01	6	4	7.876E-02	9.825E+00	1.976E+07
<b><math>a^2F^{\circ} \rightarrow x^2D^{\circ}</math></b>	0.6720	0.4383	2.337E-01	14	10	1.311E-02	2.355E+00	8.049E+06
	115 285.610	140 708.890	2.316E-01	8	6	1.299E-02	1.346E+00	7.461E+06
	114 804.370	140 708.890	2.360E-01	6	6	8.823E-04	6.729E-02	3.947E+05
	114 804.370	140 750.340	2.364E-01	6	4	1.237E-02	9.421E-01	8.331E+06
<b><math>a^2F^{\circ} \rightarrow w^2D^{\circ}</math></b>	0.6720	0.2762	3.958E-01	14	10	2.423E-03	2.571E-01	4.270E+06
	115 285.610	158 715.460	3.957E-01	8	6	2.423E-03	1.469E-01	4.063E+06
	114 804.370	158 715.460	4.001E-01	6	6	1.633E-04	7.347E-03	2.100E+05
	114 804.370	158 215.590	3.956E-01	6	4	2.261E-03	1.029E-01	4.262E+06
<b><math>a^2F^{\circ} \rightarrow z^2F^{\circ}</math></b>	0.6720	0.4424	2.297E-01	14	14	2.804E-02	5.127E+00	1.188E+07
	115 285.610	140 319.230	2.281E-01	8	8	2.685E-02	2.825E+00	1.122E+07
	115 285.610	140 230.100	2.273E-01	8	6	9.910E-04	1.046E-01	5.483E+05
	114 804.370	140 319.230	2.325E-01	6	8	1.352E-03	1.046E-01	4.401E+05
	114 804.370	140 230.100	2.317E-01	6	6	2.721E-02	2.114E+00	1.173E+07
<b><math>a^2F^{\circ} \rightarrow y^2F^{\circ}</math></b>	0.6720	0.1856	4.864E-01	14	14	4.767E-03	4.116E-01	9.060E+06
	115 285.610	168 473.480	4.846E-01	8	8	4.579E-03	2.268E-01	8.638E+06
	115 285.610	168 443.140	4.844E-01	8	6	1.695E-04	8.400E-03	4.260E+05
	114 804.370	168 473.480	4.890E-01	6	8	2.282E-04	8.400E-03	3.287E+05
	114 804.370	168 443.140	4.888E-01	6	6	4.608E-03	1.697E-01	8.842E+06
<b><math>b^2F^{\circ} \rightarrow x^2D^{\circ}</math></b>	0.4584	0.4383	2.010E-02	14	10	2.488E-02	5.199E+01	1.130E+05
	138 527.980	140 708.890	1.980E-02	8	6	2.451E-02	2.971E+01	1.029E+05
	138 509.170	140 708.890	2.000E-02	6	6	1.650E-03	1.485E+00	5.303E+03
	138 509.170	140 750.340	2.040E-02	6	4	2.357E-02	2.080E+01	1.182E+05
<b><math>b^2F^{\circ} \rightarrow w^2D^{\circ}</math></b>	0.4584	0.2762	1.822E-01	14	10	2.353E-02	5.423E+00	8.784E+06
	138 527.980	158 715.460	1.839E-01	8	6	2.374E-02	3.099E+00	8.600E+06
	138 509.170	158 715.460	1.841E-01	6	6	1.585E-03	1.549E-01	4.314E+05
	138 509.170	158 215.590	1.796E-01	6	4	2.164E-02	2.169E+00	8.411E+06
<b><math>b^2F^{\circ} \rightarrow z^2F^{\circ}</math></b>	0.4584	0.4424	1.605E-02	14	14	4.262E-03	1.115E+01	8.816E+03
	138 527.980	140 319.230	1.630E-02	8	8	4.174E-03	6.146E+00	8.908E+03
	138 527.980	140 230.100	1.550E-02	8	6	1.470E-04	2.276E-01	3.782E+02
	138 509.170	140 319.230	1.650E-02	6	8	2.087E-04	2.276E-01	3.422E+02
	138 509.170	140 230.100	1.570E-02	6	6	4.010E-03	4.598E+00	7.940E+03
<b><math>b^2F^{\circ} \rightarrow y^2F^{\circ}</math></b>	0.4584	0.1856	2.728E-01	14	14	1.903E-07	2.929E-05	1.138E+02
	138 527.980	168 473.480	2.728E-01	8	8	1.835E-07	1.614E-05	1.097E+02
	138 527.980	168 443.140	2.726E-01	8	6	6.790E-09	5.978E-07	5.404E+00
	138 509.170	168 473.480	2.730E-01	6	8	9.067E-09	5.978E-07	4.071E+00
	138 509.170	168 443.140	2.728E-01	6	6	1.830E-07	1.208E-05	1.094E+02
<b><math>c^2F^{\circ} \rightarrow w^2D^{\circ}</math></b>	0.2955	0.2762	1.930E-02	14	10	1.454E-01	3.165E+02	6.093E+05
	156 604.170	158 715.460	1.920E-02	8	6	1.447E-01	1.808E+02	5.712E+05
	156 121.700	158 715.460	2.360E-02	6	6	1.186E-02	9.042E+00	5.304E+04
	156 121.700	158 215.590	1.910E-02	6	4	1.343E-01	1.266E+02	5.904E+05

Table IV. *Continued*

Transition	$E_i$ cm <sup>-1</sup>	$E_f$ cm <sup>-1</sup>	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ s <sup>-1</sup>
$c^2F^\circ \rightarrow y^2F^\circ$	0.2955	0.1856	1.099E-01	14	14	1.229E-02	4.695E+00	1.193E+06
	156 604.170	168 473.480	1.081E-01	8	8	1.165E-02	2.587E+00	1.094E+06
	156 604.170	168 443.140	1.079E-01	8	6	4.308E-04	9.582E-02	5.371E+04
	156 121.700	168 473.480	1.125E-01	6	8	5.989E-04	9.582E-02	4.566E+04
	156 121.700	168 443.140	1.123E-01	6	6	1.208E-02	1.936E+00	1.223E+06
$d^2F^\circ \rightarrow y^2F^\circ$	0.2236	0.1856	3.798E-02	14	14	4.974E-02	5.500E+01	5.763E+05
	164 337.610	168 473.480	3.760E-02	8	8	4.748E-02	3.031E+01	5.392E+05
	164 337.610	168 443.140	3.740E-02	8	6	1.749E-03	1.122E+00	2.620E+04
	164 232.360	168 473.480	3.860E-02	6	8	2.407E-03	1.122E+00	2.160E+04
	164 232.360	168 443.140	3.840E-02	6	6	4.837E-02	2.267E+01	5.729E+05
$a^2G^\circ \rightarrow z^2F^\circ$	0.5622	0.4424	1.199E-01	18	14	1.141E-01	5.142E+01	1.693E+07
	127 128.350	140 319.230	1.202E-01	10	8	1.145E-01	2.857E+01	1.660E+07
	127 127.100	140 319.230	1.202E-01	8	8	4.088E-03	8.162E-01	4.744E+05
	127 127.100	140 230.100	1.194E-01	8	6	1.096E-01	2.204E+01	1.674E+07
$a^2G^\circ \rightarrow y^2F^\circ$	0.5622	0.1856	3.767E-01	18	14	2.826E-03	4.051E-01	4.140E+06
	127 128.350	168 473.480	3.767E-01	10	8	2.826E-03	2.251E-01	4.026E+06
	127 127.100	168 473.480	3.767E-01	8	8	1.009E-04	6.430E-03	1.150E+05
	127 127.100	168 443.140	3.765E-01	8	6	2.724E-03	1.736E-01	4.135E+06
$b^2G^\circ \rightarrow y^2F^\circ$	0.2241	0.1856	3.855E-02	18	14	2.608E-01	3.653E+02	4.003E+06
	164 268.790	168 473.480	3.830E-02	10	8	2.591E-01	2.029E+02	3.816E+06
	164 181.170	168 473.480	3.910E-02	8	8	9.446E-03	5.798E+00	1.160E+05
	164 181.170	168 443.140	3.890E-02	8	6	2.537E-01	1.566E+02	4.112E+06
$z^2S^\circ \rightarrow c^2P^\circ$	0.5772	0.4453	1.319E-01	2	6	9.295E-02	4.228E+00	4.330E+06
	125 485.290	140 016.770	1.324E-01	2	4	6.220E-02	2.819E+00	4.379E+06
	125 485.290	139 844.990	1.309E-01	2	2	3.075E-02	1.409E+00	4.232E+06
$z^2S^\circ \rightarrow d^2P^\circ$	0.5772	0.3936	1.836E-01	2	6	4.301E-01	1.406E+01	3.881E+07
	125 485.290	145 505.740	1.824E-01	2	4	2.849E-01	9.372E+00	3.807E+07
	125 485.290	145 877.660	1.858E-01	2	2	1.451E-01	4.686E+00	4.024E+07
$z^2S^\circ \rightarrow e^2P^\circ$	0.5772	0.3380	2.392E-01	2	6	3.464E-01	8.690E+00	5.307E+07
	125 485.290	151 910.830	2.408E-01	2	4	2.325E-01	5.793E+00	5.414E+07
	125 485.290	151 383.810	2.360E-01	2	2	1.139E-01	2.897E+00	5.097E+07
$z^2S^\circ \rightarrow f^2P^\circ$	0.5772	0.2720	3.052E-01	2	6	9.039E-02	1.777E+00	2.255E+07
	125 485.290	158 828.310	3.039E-01	2	4	6.000E-02	1.185E+00	2.225E+07
	125 485.290	159 283.660	3.080E-01	2	2	3.040E-02	5.923E-01	2.317E+07
$z^2S^\circ \rightarrow g^2P^\circ$	0.5772	0.2064	3.708E-01	2	6	4.962E-02	8.030E-01	1.827E+07
	125 485.290	166 185.470	3.709E-01	2	4	3.309E-02	5.353E-01	1.828E+07
	125 485.290	166 151.610	3.706E-01	2	2	1.653E-02	2.677E-01	1.824E+07
$z^2S^\circ \rightarrow h^2P^\circ$	0.5772	0.2017	3.754E-01	2	6	3.456E-03	5.523E-02	1.304E+06
	125 485.290	166 862.710	3.771E-01	2	4	2.314E-03	3.682E-02	1.322E+06
	125 485.290	166 331.190	3.722E-01	2	2	1.142E-03	1.841E-02	1.271E+06
$z^2S^\circ \rightarrow i^2P^\circ$	0.5772	0.1765	4.007E-01	2	6	7.927E-02	1.187E+00	3.407E+07
	125 485.290	169 340.390	3.996E-01	2	4	5.270E-02	7.913E-01	3.380E+07
	125 485.290	169 687.520	4.028E-01	2	2	2.656E-02	3.956E-01	3.461E+07
$z^2S^\circ \rightarrow j^2P^\circ$	0.5772	0.1342	4.430E-01	2	6	1.323E-02	1.792E-01	6.951E+06
	125 485.290	174 274.520	4.446E-01	2	4	8.850E-03	1.194E-01	7.026E+06
	125 485.290	173 749.010	4.398E-01	2	2	4.377E-03	5.972E-02	6.801E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^2P^o \rightarrow a^2S^o$	1.4969	0.6291	8.678E-01	6	2	8.039E-03	1.667E-01	1.459E+08
	24 571.540	119 783.770	8.677E-01	4	2	8.038E-03	1.112E-01	9.721E+07
	24 524.830	119 783.770	8.681E-01	2	2	8.042E-03	5.558E-02	4.868E+07
$z^2P^o \rightarrow b^2S^o$	1.4969	0.4784	1.019E+00	6	2	1.188E-01	2.099E+00	2.970E+09
	24 571.540	136 328.790	1.018E+00	4	2	1.188E-01	1.400E+00	1.979E+09
	24 524.830	136 328.790	1.019E+00	2	2	1.188E-01	6.998E-01	9.907E+08
$z^2P^o \rightarrow c^2S^o$	1.4969	0.3387	1.158E+00	6	2	1.393E-01	2.165E+00	4.504E+09
	24 571.540	151 651.720	1.158E+00	4	2	1.393E-01	1.444E+00	3.002E+09
	24 524.830	151 651.720	1.159E+00	2	2	1.394E-01	7.218E-01	1.502E+09
$z^2P^o \rightarrow d^2S^o$	1.4969	0.1797	1.317E+00	6	2	7.520E-02	1.028E+00	3.144E+09
	24 571.540	169 109.540	1.317E+00	4	2	7.519E-02	6.850E-01	2.095E+09
	24 524.830	169 109.540	1.318E+00	2	2	7.521E-02	3.425E-01	1.049E+09
$z^2P^o \rightarrow a^2P^o$	1.4969	0.7571	7.399E-01	6	6	1.990E-03	4.841E-02	8.749E+06
	24 571.540	105 599.060	7.384E-01	4	4	1.655E-03	2.689E-02	7.246E+06
	24 571.540	106 044.240	7.424E-01	4	2	3.328E-04	5.379E-03	2.947E+06
	24 524.830	105 599.060	7.388E-01	2	4	6.623E-04	5.379E-03	1.452E+06
	24 524.830	106 044.240	7.429E-01	2	2	1.332E-03	1.076E-02	5.903E+06
$z^2P^o \rightarrow b^2P^o$	1.4969	0.6884	8.086E-01	6	6	9.361E-02	2.084E+00	4.916E+08
	24 571.540	113 461.540	8.100E-01	4	4	7.814E-02	1.158E+00	4.118E+08
	24 571.540	112 937.570	8.053E-01	4	2	1.554E-02	2.315E-01	1.619E+08
	24 524.830	113 461.540	8.104E-01	2	4	3.127E-02	2.315E-01	8.249E+07
	24 524.830	112 937.570	8.057E-01	2	2	6.218E-02	4.631E-01	3.242E+08
$z^2P^o \rightarrow c^2P^o$	1.4969	0.4453	1.052E+00	6	6	3.081E-01	5.274E+00	2.737E+09
	24 571.540	140 016.770	1.052E+00	4	4	2.569E-01	2.930E+00	2.283E+09
	24 571.540	139 844.990	1.050E+00	4	2	5.130E-02	5.860E-01	9.094E+08
	24 524.830	140 016.770	1.052E+00	2	4	1.028E-01	5.860E-01	4.572E+08
	24 524.830	139 844.990	1.051E+00	2	2	2.053E-01	1.172E+00	1.821E+09
$z^2P^o \rightarrow d^2P^o$	1.4969	0.3936	1.103E+00	6	6	7.068E-02	1.153E+00	6.910E+08
	24 571.540	145 505.740	1.102E+00	4	4	5.883E-02	6.406E-01	5.738E+08
	24 571.540	145 877.660	1.105E+00	4	2	1.180E-02	1.281E-01	2.317E+08
	24 524.830	145 505.740	1.102E+00	2	4	2.354E-02	1.281E-01	1.149E+08
	24 524.830	145 877.660	1.106E+00	2	2	4.722E-02	2.562E-01	4.638E+08
$z^2P^o \rightarrow e^2P^o$	1.4969	0.3380	1.159E+00	6	6	2.622E-02	4.072E-01	2.828E+08
	24 571.540	151 910.830	1.160E+00	4	4	2.187E-02	2.262E-01	2.366E+08
	24 571.540	151 383.810	1.156E+00	4	2	4.357E-03	4.524E-02	9.346E+07
	24 524.830	151 910.830	1.161E+00	2	4	8.753E-03	4.524E-02	4.737E+07
	24 524.830	151 383.810	1.156E+00	2	2	1.743E-02	9.048E-02	1.871E+08
$z^2P^o \rightarrow f^2P^o$	1.4969	0.2720	1.225E+00	6	6	2.552E-01	3.750E+00	3.076E+09
	24 571.540	158 828.310	1.223E+00	4	4	2.124E-01	2.083E+00	2.554E+09
	24 571.540	159 283.660	1.228E+00	4	2	4.263E-02	4.167E-01	1.032E+09
	24 524.830	158 828.310	1.224E+00	2	4	8.500E-02	4.167E-01	5.114E+08
	24 524.830	159 283.660	1.228E+00	2	2	1.706E-01	8.334E-01	2.066E+09
$z^2P^o \rightarrow g^2P^o$	1.4969	0.2064	1.291E+00	6	6	1.418E-02	1.978E-01	1.897E+08
	24 571.540	166 185.470	1.290E+00	4	4	1.182E-02	1.099E-01	1.581E+08
	24 571.540	166 151.610	1.290E+00	4	2	2.363E-03	2.197E-02	6.318E+07
	24 524.830	166 185.470	1.291E+00	2	4	4.728E-03	2.197E-02	3.164E+07
	24 524.830	166 151.610	1.291E+00	2	2	9.454E-03	4.395E-02	1.265E+08
$z^2P^o \rightarrow h^2P^o$	1.4969	0.2017	1.295E+00	6	6	1.902E-03	2.644E-02	2.563E+07
	24 571.540	166 862.710	1.297E+00	4	4	1.587E-03	1.469E-02	2.143E+07
	24 571.540	166 331.190	1.292E+00	4	2	3.162E-04	2.937E-03	8.477E+06
	24 524.830	166 862.710	1.297E+00	2	4	6.390E-04	2.937E-03	4.291E+06
	24 524.830	166 331.190	1.292E+00	2	2	1.265E-03	5.875E-03	1.697E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{ji}^{J_1}$ $\text{s}^{-1}$
$z^2P^o \rightarrow i^2P^o$	1.4969	0.1765	1.320E+00	6	6	1.478E-01	2.015E+00	2.070E+09
	24 571.540	169 340.390	1.319E+00	4	4	1.231E-01	1.119E+00	1.720E+09
	24 571.540	169 687.520	1.322E+00	4	2	2.467E-02	2.239E-01	6.930E+08
	24 524.830	169 340.390	1.320E+00	2	4	4.924E-02	2.239E-01	3.443E+08
	24 524.830	169 687.520	1.323E+00	2	2	9.871E-02	4.477E-01	1.387E+09
$z^2P^o \rightarrow j^2P^o$	1.4969	0.1342	1.363E+00	6	6	7.781E-03	1.028E-01	1.161E+08
	24 571.540	174 274.520	1.364E+00	4	4	6.491E-03	5.710E-02	9.703E+07
	24 571.540	173 749.010	1.359E+00	4	2	1.294E-03	1.142E-02	3.841E+07
	24 524.830	174 274.520	1.365E+00	2	4	2.597E-03	1.142E-02	1.942E+07
	24 524.830	173 749.010	1.360E+00	2	2	5.176E-03	2.284E-02	7.688E+07
$z^2P^o \rightarrow a^2D^o$	1.4969	0.8285	6.684E-01	6	10	3.266E-03	8.796E-02	7.034E+06
	24 571.540	97 918.860	6.684E-01	4	6	2.940E-03	5.278E-02	7.032E+06
	24 571.540	97 890.740	6.681E-01	4	4	3.265E-04	5.864E-03	1.171E+06
	24 524.830	97 890.740	6.686E-01	2	4	3.267E-03	2.932E-02	5.865E+06
$z^2P^o \rightarrow b^2D^o$	1.4969	0.6132	8.837E-01	6	10	4.219E-02	8.594E-01	1.588E+08
	24 571.540	121 530.020	8.836E-01	4	6	3.797E-02	5.157E-01	1.587E+08
	24 571.540	121 528.720	8.836E-01	4	4	4.219E-03	5.730E-02	2.646E+07
	24 524.830	121 528.720	8.840E-01	2	4	4.221E-02	2.865E-01	1.325E+08
$z^2P^o \rightarrow c^2D^o$	1.4969	0.5029	9.940E-01	6	10	3.049E-01	5.521E+00	1.452E+09
	24 571.540	133 814.840	9.955E-01	4	6	2.748E-01	3.313E+00	1.458E+09
	24 571.540	133 360.860	9.914E-01	4	4	3.041E-02	3.681E-01	2.401E+08
	24 524.830	133 360.860	9.918E-01	2	4	3.042E-01	1.840E+00	1.202E+09
$z^2P^o \rightarrow d^2D^o$	1.4969	0.4079	1.089E+00	6	10	1.281E-02	2.118E-01	7.323E+07
	24 571.540	144 009.420	1.088E+00	4	6	1.152E-02	1.271E-01	7.310E+07
	24 571.540	144 142.160	1.090E+00	4	4	1.282E-03	1.412E-02	1.222E+07
	24 524.830	144 142.160	1.090E+00	2	4	1.282E-02	7.059E-02	6.119E+07
$z^2P^o \rightarrow e^2D^o$	1.4969	0.3639	1.133E+00	6	10	4.900E-01	7.785E+00	3.032E+09
	24 571.540	148 886.570	1.133E+00	4	6	4.410E-01	4.671E+00	3.031E+09
	24 571.540	148 900.910	1.133E+00	4	4	4.900E-02	5.190E-01	5.052E+08
	24 524.830	148 900.910	1.133E+00	2	4	4.902E-01	2.595E+00	2.529E+09
$z^2P^o \rightarrow f^2D^o$	1.4969	0.2673	1.230E+00	6	10	3.879E-01	5.679E+00	2.827E+09
	24 571.540	159 492.830	1.229E+00	4	6	3.491E-01	3.407E+00	2.826E+09
	24 571.540	159 495.940	1.229E+00	4	4	3.879E-02	3.786E-01	4.710E+08
	24 524.830	159 495.940	1.230E+00	2	4	3.880E-01	1.893E+00	2.357E+09
$z^2P^o \rightarrow g^2D^o$	1.4969	0.2469	1.250E+00	6	10	1.915E-02	2.758E-01	1.443E+08
	24 571.540	161 733.100	1.250E+00	4	6	1.724E-02	1.655E-01	1.442E+08
	24 571.540	161 737.990	1.250E+00	4	4	1.915E-03	1.839E-02	2.404E+07
	24 524.830	161 737.990	1.250E+00	2	4	1.916E-02	9.194E-02	1.203E+08
$z^2P^o \rightarrow h^2D^o$	1.4969	0.1944	1.303E+00	6	10	7.514E-02	1.038E+00	6.144E+08
	24 571.540	167 506.390	1.302E+00	4	6	6.763E-02	6.231E-01	6.144E+08
	24 571.540	167 472.420	1.302E+00	4	4	7.512E-03	6.923E-02	1.023E+08
	24 524.830	167 472.420	1.303E+00	2	4	7.515E-02	3.461E-01	5.121E+08
$z^2P^o \rightarrow i^2D^o$	1.4969	0.1717	1.325E+00	6	10	1.533E-01	2.082E+00	1.297E+09
	24 571.540	170 015.230	1.325E+00	4	6	1.380E-01	1.249E+00	1.298E+09
	24 571.540	169 922.270	1.324E+00	4	4	1.532E-02	1.388E-01	2.158E+08
	24 524.830	169 922.270	1.325E+00	2	4	1.532E-01	6.939E-01	1.080E+09
$z^2P^o \rightarrow j^2D^o$	1.4969	0.1071	1.390E+00	6	10	6.527E-03	8.454E-02	6.077E+07
	24 571.540	177 076.280	1.390E+00	4	6	5.874E-03	5.072E-02	6.075E+07
	24 571.540	177 077.020	1.390E+00	4	4	6.527E-04	5.636E-03	1.012E+07
	24 524.830	177 077.020	1.390E+00	2	4	6.529E-03	2.818E-02	5.067E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^2P^o \rightarrow k^2D^o$	1.4969	0.0381	1.459E+00	6	10	1.648E-02	2.033E-01	1.690E+08
	24 571.540	184 642.760	1.459E+00	4	6	1.483E-02	1.220E-01	1.689E+08
	24 571.540	184 642.760	1.459E+00	4	4	1.647E-03	1.355E-02	2.816E+07
	24 524.830	184 642.760	1.459E+00	2	4	1.648E-02	6.776E-02	1.409E+08
$y^2P^o b^2S^o$	0.5055	0.4784	2.709E-02	6	2	9.425E-04	6.263E-01	1.667E+04
	133 399.970	136 328.790	2.670E-02	4	2	9.290E-04	4.175E-01	1.064E+04
	133 268.680	136 328.790	2.790E-02	2	2	9.708E-04	2.088E-01	6.070E+03
$y^2P^o \rightarrow c^2S^o$	0.5055	0.3387	1.667E-01	6	2	6.022E-03	6.501E-01	4.033E+06
	133 399.970	151 651.720	1.664E-01	4	2	6.010E-03	4.334E-01	2.673E+06
	133 268.680	151 651.720	1.676E-01	2	2	6.053E-03	2.167E-01	1.366E+06
$y^2P^o \rightarrow d^2S^o$	0.5055	0.1797	3.258E-01	6	2	5.689E-03	3.143E-01	1.455E+07
	133 399.970	169 109.540	3.254E-01	4	2	5.682E-03	2.095E-01	9.664E+06
	133 268.680	169 109.540	3.266E-01	2	2	5.703E-03	1.048E-01	4.886E+06
$y^2P^o \rightarrow c^2P^o$	0.5055	0.4453	6.017E-02	6	6	9.800E-03	2.932E+00	2.850E+05
	133 399.970	140 016.770	6.030E-02	4	4	8.184E-03	1.629E+00	2.390E+05
	133 399.970	139 844.990	5.880E-02	4	2	1.596E-03	3.257E-01	8.865E+04
	133 268.680	140 016.770	6.150E-02	2	4	3.339E-03	3.257E-01	5.072E+04
	133 268.680	139 844.990	6.000E-02	2	2	6.515E-03	6.515E-01	1.884E+05
$y^2P^o \rightarrow d^2P^o$	0.5055	0.3936	1.118E-01	6	6	1.973E-01	3.176E+01	1.983E+07
	133 399.970	145 505.740	1.103E-01	4	4	1.622E-01	1.764E+01	1.585E+07
	133 399.970	145 877.660	1.137E-01	4	2	3.343E-02	3.528E+00	6.943E+06
	133 268.680	145 505.740	1.115E-01	2	4	6.557E-02	3.528E+00	3.274E+06
	133 268.680	145 877.660	1.149E-01	2	2	1.351E-01	7.057E+00	1.433E+07
$y^2P^o \rightarrow e^2P^o$	0.5055	0.3380	1.675E-01	6	6	1.409E-01	1.515E+01	3.176E+07
	133 399.970	151 910.830	1.687E-01	4	4	1.183E-01	8.416E+00	2.705E+07
	133 399.970	151 383.810	1.639E-01	4	2	2.299E-02	1.683E+00	9.921E+06
	133 268.680	151 910.830	1.699E-01	2	4	4.766E-02	1.683E+00	5.525E+06
	133 268.680	151 383.810	1.651E-01	2	2	9.263E-02	3.366E+00	2.028E+07
$y^2P^o \rightarrow f^2P^o$	0.5055	0.2720	2.335E-01	6	6	6.665E-02	5.138E+00	2.919E+07
	133 399.970	158 828.310	2.318E-01	4	4	5.514E-02	2.854E+00	2.380E+07
	133 399.970	159 283.660	2.359E-01	4	2	1.122E-02	5.709E-01	1.003E+07
	133 268.680	158 828.310	2.330E-01	2	4	2.217E-02	5.709E-01	4.834E+06
	133 268.680	159 283.660	2.371E-01	2	2	4.512E-02	1.142E+00	2.037E+07
$y^2P^o \rightarrow g^2P^o$	0.5055	0.2064	2.991E-01	6	6	3.082E-04	1.855E-02	2.214E+05
	133 399.970	166 185.470	2.988E-01	4	4	2.566E-04	1.031E-02	1.840E+05
	133 399.970	166 151.610	2.985E-01	4	2	5.127E-05	2.061E-03	7.338E+04
	133 268.680	166 185.470	3.000E-01	2	4	1.031E-04	2.061E-03	3.725E+04
	133 268.680	166 151.610	2.997E-01	2	2	2.059E-04	4.122E-03	1.485E+05
$y^2P^o \rightarrow h^2P^o$	0.5055	0.2017	3.037E-01	6	6	4.896E-02	2.902E+00	3.628E+07
	133 399.970	166 862.710	3.050E-01	4	4	4.097E-02	1.612E+00	3.061E+07
	133 399.970	166 331.190	3.001E-01	4	2	8.063E-03	3.224E-01	1.166E+07
	133 268.680	166 862.710	3.062E-01	2	4	1.645E-02	3.224E-01	6.195E+06
	133 268.680	166 331.190	3.013E-01	2	2	3.238E-02	6.448E-01	2.361E+07
$y^2P^o \rightarrow i^2P^o$	0.5055	0.1765	3.290E-01	6	6	1.632E-02	8.927E-01	1.418E+07
	133 399.970	169 340.390	3.275E-01	4	4	1.354E-02	4.960E-01	1.166E+07
	133 399.970	169 687.520	3.307E-01	4	2	2.734E-03	9.919E-02	4.803E+06
	133 268.680	169 340.390	3.287E-01	2	4	5.434E-03	9.919E-02	2.358E+06
	133 268.680	169 687.520	3.319E-01	2	2	1.097E-02	1.984E-01	9.710E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^2P^o \rightarrow j^2P^o$	0.5055	0.1342	3.713E-01	6	6	7.287E-03	3.533E-01	8.068E+06
	133 399.970	174 274.520	3.725E-01	4	4	6.092E-03	1.963E-01	6.790E+06
	133 399.970	173 749.010	3.677E-01	4	2	1.203E-03	3.925E-02	2.612E+06
	133 268.680	174 274.520	3.737E-01	2	4	2.445E-03	3.925E-02	1.371E+06
	133 268.680	173 749.010	3.689E-01	2	2	4.827E-03	7.851E-02	5.276E+06
$y^2P^o \rightarrow c^2D^o$	0.5055	0.5029	2.525E-03	6	10	5.186E-03	3.698E+01	1.593E+02
	133 399.970	133 814.840	3.800E-03	4	6	7.025E-03	2.219E+01	5.432E+02
	133 360.860	133 399.970	3.000E-04	4	4	6.163E-05	2.465E+00	4.455E-02
	133 268.680	133 360.860	9.000E-04	2	4	1.849E-03	1.233E+01	6.014E+00
$y^2P^o \rightarrow d^2D^o$	0.5055	0.4079	9.756E-02	6	10	5.659E-02	1.044E+01	2.596E+06
	133 399.970	144 009.420	9.670E-02	4	6	5.048E-02	6.264E+00	2.528E+06
	133 399.970	144 142.160	9.790E-02	4	4	5.678E-03	6.960E-01	4.372E+05
	133 268.680	144 142.160	9.910E-02	2	4	5.748E-02	3.480E+00	2.267E+06
$y^2P^o \rightarrow e^2D^o$	0.5055	0.3639	1.416E-01	6	10	1.022E-01	1.300E+01	9.876E+06
	133 399.970	148 886.570	1.412E-01	4	6	9.177E-02	7.799E+00	9.797E+06
	133 399.970	148 900.910	1.413E-01	4	4	1.020E-02	8.666E-01	1.636E+06
	133 268.680	148 900.910	1.425E-01	2	4	1.029E-01	4.333E+00	8.392E+06
$y^2P^o \rightarrow f^2D^o$	0.5055	0.2673	2.382E-01	6	10	2.963E-01	2.239E+01	8.102E+07
	133 399.970	159 492.830	2.378E-01	4	6	2.663E-01	1.344E+01	8.063E+07
	133 399.970	159 495.940	2.378E-01	4	4	2.958E-02	1.493E+00	1.344E+07
	133 268.680	159 495.940	2.390E-01	2	4	2.973E-01	7.464E+00	6.821E+07
$y^2P^o \rightarrow g^2D^o$	0.5055	0.2469	2.586E-01	6	10	5.660E-03	3.940E-01	1.824E+06
	133 399.970	161 733.100	2.582E-01	4	6	5.086E-03	2.364E-01	1.816E+06
	133 399.970	161 737.990	2.583E-01	4	4	5.653E-04	2.626E-02	3.030E+05
	133 268.680	161 737.990	2.595E-01	2	4	5.680E-03	1.313E-01	1.536E+06
$y^2P^o \rightarrow h^2D^o$	0.5055	0.1944	3.111E-01	6	10	3.266E-02	1.890E+00	1.523E+07
	133 399.970	167 506.390	3.108E-01	4	6	2.937E-02	1.134E+00	1.519E+07
	133 399.970	167 472.420	3.105E-01	4	4	3.260E-03	1.260E-01	2.525E+06
	133 268.680	167 472.420	3.117E-01	2	4	3.273E-02	6.300E-01	1.277E+07
$y^2P^o \rightarrow i^2D^o$	0.5055	0.1717	3.337E-01	6	10	7.654E-02	4.129E+00	4.108E+07
	133 399.970	170 015.230	3.337E-01	4	6	6.888E-02	2.477E+00	4.108E+07
	133 399.970	169 922.270	3.328E-01	4	4	7.633E-03	2.752E-01	6.791E+06
	133 268.680	169 922.270	3.340E-01	2	4	7.661E-02	1.376E+00	3.432E+07
$y^2P^o \rightarrow j^2D^o$	0.5055	0.1071	3.984E-01	6	10	1.816E-03	8.205E-02	1.389E+06
	133 399.970	177 076.280	3.980E-01	4	6	1.633E-03	4.923E-02	1.385E+06
	133 399.970	177 077.020	3.980E-01	4	4	1.814E-04	5.470E-03	2.308E+05
	133 268.680	177 077.020	3.992E-01	2	4	1.820E-03	2.735E-02	1.165E+06
$y^2P^o \rightarrow k^2D^o$	0.5055	0.0381	4.674E-01	6	10	4.334E-03	1.669E-01	4.562E+06
	133 399.970	184 642.760	4.670E-01	4	6	3.898E-03	1.002E-01	4.552E+06
	133 399.970	184 642.760	4.670E-01	4	4	4.331E-04	1.113E-02	7.586E+05
	133 268.680	184 642.760	4.682E-01	2	4	4.342E-03	5.564E-02	3.822E+06
$x^2P^o \rightarrow c^2S^o$	0.4123	0.3387	7.357E-02	6	2	4.242E-02	1.038E+01	5.532E+06
	143 623.560	151 651.720	7.320E-02	4	2	4.221E-02	6.919E+00	3.633E+06
	143 488.950	151 651.720	7.440E-02	2	2	4.290E-02	3.460E+00	1.907E+06
$x^2P^o \rightarrow d^2S^o$	0.4123	0.1797	2.327E-01	6	2	9.744E-02	7.539E+00	1.271E+08
	143 623.560	169 109.540	2.322E-01	4	2	9.725E-02	5.026E+00	8.424E+07
	143 488.950	169 109.540	2.334E-01	2	2	9.776E-02	2.513E+00	4.277E+07



Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$x^2P^\circ \rightarrow d^2P^\circ$	0.4123	0.3936	1.869E-02	6	6	8.777E-05	8.453E-02	2.463E+02
	143 623.560	145 505.740	1.710E-02	4	4	6.692E-05	4.696E-02	1.572E+02
	143 623.560	145 877.660	2.050E-02	4	2	1.604E-05	9.392E-03	1.083E+02
	143 488.950	145 505.740	1.830E-02	2	4	2.865E-05	9.392E-03	3.853E+01
	143 488.950	145 877.660	2.170E-02	2	2	6.793E-05	1.878E-02	2.569E+02
$x^2P^\circ \rightarrow e^2P^\circ$	0.4123	0.3380	7.433E-02	6	6	2.522E-02	6.109E+00	1.119E+06
	143 623.560	151 910.830	7.550E-02	4	4	2.135E-02	3.394E+00	9.776E+05
	143 623.560	151 383.810	7.070E-02	4	2	3.999E-03	6.787E-01	3.211E+05
	143 488.950	151 910.830	7.670E-02	2	4	8.676E-03	6.787E-01	2.050E+05
	143 488.950	151 383.810	7.190E-02	2	2	1.627E-02	1.357E+00	6.755E+05
$x^2P^\circ \rightarrow f^2P^\circ$	0.4123	0.2720	1.403E-01	6	6	3.757E-03	4.818E-01	5.944E+05
	143 623.560	158 828.310	1.386E-01	4	4	3.092E-03	2.677E-01	4.770E+05
	143 623.560	159 283.660	1.427E-01	4	2	6.366E-04	5.354E-02	2.083E+05
	143 488.950	158 828.310	1.398E-01	2	4	1.247E-03	5.354E-02	9.791E+04
	143 488.950	159 283.660	1.439E-01	2	2	2.568E-03	1.071E-01	4.271E+05
$x^2P^\circ \rightarrow g^2P^\circ$	0.4123	0.2064	2.059E-01	6	6	1.639E-01	1.433E+01	5.583E+07
	143 623.560	166 185.470	2.056E-01	4	4	1.364E-01	7.962E+00	4.632E+07
	143 623.560	166 151.610	2.053E-01	4	2	2.724E-02	1.592E+00	1.845E+07
	143 488.950	166 185.470	2.068E-01	2	4	5.488E-02	1.592E+00	9.426E+06
	143 488.950	166 151.610	2.065E-01	2	2	1.096E-01	3.185E+00	3.754E+07
$x^2P^\circ \rightarrow h^2P^\circ$	0.4123	0.2017	2.106E-01	6	6	1.563E-01	1.336E+01	5.565E+07
	143 623.560	166 862.710	2.118E-01	4	4	1.310E-01	7.421E+00	4.720E+07
	143 623.560	166 331.190	2.069E-01	4	2	2.559E-02	1.484E+00	1.760E+07
	143 488.950	166 862.710	2.130E-01	2	4	5.269E-02	1.484E+00	9.601E+06
	143 488.950	166 331.190	2.081E-01	2	2	1.030E-01	2.968E+00	3.581E+07
$x^2P^\circ \rightarrow i^2P^\circ$	0.4123	0.1765	2.358E-01	6	6	4.651E-02	3.550E+00	2.078E+07
	143 623.560	169 340.390	2.343E-01	4	4	3.851E-02	1.972E+00	1.698E+07
	143 623.560	169 687.520	2.375E-01	4	2	7.808E-03	3.945E-01	7.075E+06
	143 488.950	169 340.390	2.355E-01	2	4	1.548E-02	3.945E-01	3.449E+06
	143 488.950	169 687.520	2.387E-01	2	2	3.139E-02	7.890E-01	1.437E+07
$x^2P^\circ \rightarrow j^2P^\circ$	0.4123	0.1342	2.781E-01	6	6	1.564E-04	1.012E-02	9.717E+04
	143 623.560	174 274.520	2.793E-01	4	4	1.309E-04	5.623E-03	8.201E+04
	143 623.560	173 749.010	2.745E-01	4	2	2.573E-05	1.125E-03	3.114E+04
	143 488.950	174 274.520	2.805E-01	2	4	5.258E-05	1.125E-03	1.661E+04
	143 488.950	173 749.010	2.757E-01	2	2	1.034E-04	2.249E-03	6.310E+04
$x^2P^\circ \rightarrow d^2D^\circ$	0.4123	0.4079	4.409E-03	6	10	3.103E-03	1.267E+01	2.907E+02
	143 623.560	144 009.420	3.500E-03	4	6	2.217E-03	7.600E+00	1.454E+02
	143 623.560	144 142.160	4.700E-03	4	4	3.307E-04	8.445E-01	5.869E+01
	143 488.950	144 142.160	5.900E-03	2	4	4.152E-03	4.222E+00	5.804E+02
$x^2P^\circ \rightarrow e^2D^\circ$	0.4123	0.3639	4.842E-02	6	10	6.550E-02	2.435E+01	7.401E+05
	143 623.560	148 886.570	4.800E-02	4	6	5.843E-02	1.461E+01	7.209E+05
	143 623.560	148 900.910	4.810E-02	4	4	6.506E-03	1.623E+00	1.209E+05
	143 488.950	148 900.910	4.930E-02	2	4	6.668E-02	8.116E+00	6.509E+05
$x^2P^\circ \rightarrow f^2D^\circ$	0.4123	0.2673	1.450E-01	6	10	1.557E-02	1.932E+00	1.578E+06
	143 623.560	159 492.830	1.446E-01	4	6	1.397E-02	1.159E+00	1.564E+06
	143 623.560	159 495.940	1.446E-01	4	4	1.552E-03	1.288E-01	2.607E+05
	143 488.950	159 495.940	1.458E-01	2	4	1.565E-02	6.441E-01	1.336E+06
$x^2P^\circ \rightarrow g^2D^\circ$	0.4123	0.2469	1.655E-01	6	10	1.861E-01	2.025E+01	2.456E+07
	143 623.560	161 733.100	1.650E-01	4	6	1.671E-01	1.215E+01	2.436E+07
	143 623.560	161 737.990	1.651E-01	4	4	1.857E-02	1.350E+00	4.067E+06
	143 488.950	161 737.990	1.663E-01	2	4	1.871E-01	6.750E+00	2.078E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$x^2P^\circ \rightarrow h^2D^\circ$	0.4123	0.1944	2.179E-01	6	10	2.021E-01	1.670E+01	4.626E+07
	143 623.560	167 506.390	2.176E-01	4	6	1.817E-01	1.002E+01	4.606E+07
	143 623.560	167 472.420	2.173E-01	4	4	2.016E-02	1.113E+00	7.645E+06
	143 488.950	167 472.420	2.185E-01	2	4	2.027E-01	5.566E+00	3.886E+07
$x^2P^\circ \rightarrow i^2D^\circ$	0.4123	0.1717	2.406E-01	6	10	2.954E-02	2.210E+00	8.239E+06
	143 623.560	170 015.230	2.405E-01	4	6	2.658E-02	1.326E+00	8.232E+06
	143 623.560	169 922.270	2.396E-01	4	4	2.942E-03	1.474E-01	1.357E+06
	143 488.950	169 922.270	2.408E-01	2	4	2.957E-02	7.368E-01	6.886E+06
$x^2P^\circ \rightarrow j^2D^\circ$	0.4123	0.1071	3.053E-01	6	10	2.104E-02	1.241E+00	9.450E+06
	143 623.560	177 076.280	3.048E-01	4	6	1.891E-02	7.445E-01	9.408E+06
	143 623.560	177 077.020	3.048E-01	4	4	2.101E-03	8.272E-02	1.568E+06
	143 488.950	177 077.020	3.060E-01	2	4	2.109E-02	4.136E-01	7.933E+06
$x^2P^\circ \rightarrow k^2D^\circ$	0.4123	0.0381	3.742E-01	6	10	2.833E-04	1.363E-02	1.912E+05
	143 623.560	184 642.760	3.738E-01	4	6	2.547E-04	8.177E-03	1.906E+05
	143 623.560	184 642.760	3.738E-01	4	4	2.830E-05	9.086E-04	3.176E+04
	143 488.950	184 642.760	3.750E-01	2	4	2.839E-04	4.543E-03	1.604E+05
$w^2P^\circ \rightarrow d^2S^\circ$	0.2969	0.1797	1.173E-01	6	2	4.995E-04	7.667E-02	1.656E+05
	156 276.830	169 109.540	1.169E-01	4	2	4.979E-04	5.112E-02	1.093E+05
	156 167.040	169 109.540	1.179E-01	2	2	5.022E-04	2.556E-02	5.607E+04
$w^2P^\circ \rightarrow f^2P^\circ$	0.2969	0.2720	2.497E-02	6	6	1.587E-02	1.144E+01	7.945E+04
	156 276.830	158 828.310	2.330E-02	4	4	1.234E-02	6.355E+00	5.381E+04
	156 276.830	159 283.660	2.740E-02	4	2	2.902E-03	1.271E+00	3.500E+04
	156 167.040	158 828.310	2.430E-02	2	4	5.148E-03	1.271E+00	1.221E+04
	156 167.040	159 283.660	2.840E-02	2	2	1.203E-02	2.542E+00	7.796E+04
$w^2P^\circ \rightarrow g^2P^\circ$	0.2969	0.2064	9.052E-02	6	6	1.604E-02	3.189E+00	1.056E+06
	156 276.830	166 185.470	9.030E-02	4	4	1.333E-02	1.772E+00	8.733E+05
	156 276.830	166 151.610	9.000E-02	4	2	2.658E-03	3.544E-01	3.458E+05
	156 167.040	166 185.470	9.130E-02	2	4	5.392E-03	3.544E-01	1.805E+05
	156 167.040	166 151.610	9.100E-02	2	2	1.075E-02	7.087E-01	7.150E+05
$w^2P^\circ \rightarrow h^2P^\circ$	0.2969	0.2017	9.518E-02	6	6	9.706E-04	1.835E-01	7.063E+04
	156 276.830	166 862.710	9.650E-02	4	4	8.200E-04	1.020E-01	6.133E+04
	156 276.830	166 331.190	9.160E-02	4	2	1.557E-04	2.039E-02	2.098E+04
	156 167.040	166 862.710	9.750E-02	2	4	3.314E-04	2.039E-02	1.265E+04
	156 167.040	166 331.190	9.260E-02	2	2	6.295E-04	4.079E-02	4.335E+04
$w^2P^\circ \rightarrow i^2P^\circ$	0.2969	0.1765	1.204E-01	6	6	1.556E-02	2.326E+00	1.813E+06
	156 276.830	169 340.390	1.190E-01	4	4	1.282E-02	1.292E+00	1.458E+06
	156 276.830	169 687.520	1.222E-01	4	2	2.632E-03	2.585E-01	6.314E+05
	156 167.040	169 340.390	1.200E-01	2	4	5.169E-03	2.585E-01	2.990E+05
	156 167.040	169 687.520	1.232E-01	2	2	1.061E-02	5.169E-01	1.294E+06
$w^2P^\circ \rightarrow j^2P^\circ$	0.2969	0.1342	1.627E-01	6	6	2.521E-03	2.788E-01	5.363E+05
	156 276.830	174 274.520	1.640E-01	4	4	2.117E-03	1.549E-01	4.573E+05
	156 276.830	173 749.010	1.592E-01	4	2	4.110E-04	3.098E-02	1.673E+05
	156 167.040	174 274.520	1.650E-01	2	4	8.519E-04	3.098E-02	9.314E+04
	156 167.040	173 749.010	1.602E-01	2	2	1.654E-03	6.196E-02	3.410E+05
$w^2P^\circ \rightarrow f^2D^\circ$	0.2969	0.2673	2.965E-02	6	10	5.422E-03	3.291E+00	2.297E+04
	156 276.830	159 492.830	2.930E-02	4	6	4.822E-03	1.975E+00	2.217E+04
	156 276.830	159 495.940	2.930E-02	4	4	5.357E-04	2.194E-01	3.694E+03
	156 167.040	159 495.940	3.030E-02	2	4	5.540E-03	1.097E+00	2.043E+04

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$w^2P^\circ \rightarrow g^2D^\circ$	0.2969	0.2469	5.007E-02	6	10	5.202E-03	1.870E+00	6.286E+04
	156 276.830	161 733.100	4.970E-02	4	6	4.647E-03	1.122E+00	6.147E+04
	156 276.830	161 737.990	4.980E-02	4	4	5.174E-04	1.247E-01	1.031E+04
	156 167.040	161 737.990	5.080E-02	2	4	5.278E-03	6.234E-01	5.470E+04
$w^2P^\circ \rightarrow h^2D^\circ$	0.2969	0.1944	1.025E-01	6	10	2.465E-03	4.326E-01	1.249E+05
	156 276.830	167 506.390	1.023E-01	4	6	2.213E-03	2.596E-01	1.240E+05
	156 276.830	167 472.420	1.020E-01	4	4	2.452E-04	2.884E-02	2.049E+04
	156 167.040	167 472.420	1.030E-01	2	4	2.476E-03	1.442E-01	1.055E+05
$w^2P^\circ \rightarrow i^2D^\circ$	0.2969	0.1717	1.252E-01	6	10	9.950E-02	1.431E+01	7.515E+06
	156 276.830	170 015.230	1.252E-01	4	6	8.955E-02	8.584E+00	7.517E+06
	156 276.830	169 922.270	1.243E-01	4	4	9.879E-03	9.537E-01	1.226E+06
	156 167.040	169 922.270	1.253E-01	2	4	9.958E-02	4.769E+00	6.279E+06
$w^2P^\circ \rightarrow j^2D^\circ$	0.2969	0.1071	1.899E-01	6	10	1.475E-05	1.398E-03	2.563E+03
	156 276.830	177 076.280	1.895E-01	4	6	1.325E-05	8.390E-04	2.548E+03
	156 276.830	177 077.020	1.895E-01	4	4	1.472E-06	9.323E-05	4.246E+02
	156 167.040	177 077.020	1.905E-01	2	4	1.480E-05	4.661E-04	2.157E+03
$w^2P^\circ \rightarrow k^2D^\circ$	0.2969	0.0381	2.588E-01	6	10	5.137E-03	3.573E-01	1.658E+06
	156 276.830	184 642.760	2.585E-01	4	6	4.618E-03	2.144E-01	1.652E+06
	156 276.830	184 642.760	2.585E-01	4	4	5.131E-04	2.382E-02	2.754E+05
	156 167.040	184 642.760	2.595E-01	2	4	5.150E-03	1.191E-01	1.393E+06
$z^2D^\circ \rightarrow a^2P^\circ$	1.5852	0.7571	8.281E-01	10	6	4.402E-03	1.595E-01	4.042E+07
	14 884.730	105 599.060	8.267E-01	6	4	4.394E-03	9.569E-02	3.618E+07
	14 852.940	105 599.060	8.269E-01	4	4	7.327E-04	1.063E-02	4.024E+06
	14 852.940	106 044.240	8.310E-01	4	2	3.681E-03	5.316E-02	4.084E+07
$z^2D^\circ \rightarrow b^2P^\circ$	1.5852	0.6884	8.968E-01	10	6	1.451E-01	4.853E+00	1.562E+09
	14 884.730	113 461.540	8.983E-01	6	4	1.453E-01	2.912E+00	1.413E+09
	14 852.940	113 461.540	8.986E-01	4	4	2.423E-02	3.235E-01	1.571E+08
	14 852.940	112 937.570	8.939E-01	4	2	1.205E-01	1.618E+00	1.547E+09
$z^2D^\circ \rightarrow c^2P^\circ$	1.5852	0.4453	1.140E+00	10	6	7.654E-02	2.014E+00	1.331E+09
	14 884.730	140 016.770	1.140E+00	6	4	7.656E-02	1.209E+00	1.199E+09
	14 852.940	140 016.770	1.141E+00	4	4	1.276E-02	1.343E-01	1.334E+08
	14 852.940	139 844.990	1.139E+00	4	2	6.373E-02	6.714E-01	1.328E+09
$z^2D^\circ \rightarrow d^2P^\circ$	1.5852	0.3936	1.192E+00	10	6	2.228E-01	5.609E+00	4.234E+09
	14 884.730	145 505.740	1.190E+00	6	4	2.225E-01	3.365E+00	3.798E+09
	14 852.940	145 505.740	1.191E+00	4	4	3.710E-02	3.739E-01	4.223E+08
	14 852.940	145 877.660	1.194E+00	4	2	1.860E-01	1.870E+00	4.260E+09
$z^2D^\circ \rightarrow e^2P^\circ$	1.5852	0.3380	1.247E+00	10	6	1.892E-02	4.551E-01	3.940E+08
	14 884.730	151 910.830	1.249E+00	6	4	1.894E-02	2.730E-01	3.558E+08
	14 852.940	151 910.830	1.249E+00	4	4	3.158E-03	3.034E-02	3.956E+07
	14 852.940	151 383.810	1.244E+00	4	2	1.573E-02	1.517E-01	3.911E+08
$z^2D^\circ \rightarrow f^2P^\circ$	1.5852	0.2720	1.313E+00	10	6	1.277E-01	2.918E+00	2.948E+09
	14 884.730	158 828.310	1.312E+00	6	4	1.276E-01	1.751E+00	2.645E+09
	14 852.940	158 828.310	1.312E+00	4	4	2.127E-02	1.945E-01	2.941E+08
	14 852.940	159 283.660	1.316E+00	4	2	1.067E-01	9.725E-01	2.968E+09
$z^2D^\circ \rightarrow g^2P^\circ$	1.5852	0.2064	1.379E+00	10	6	4.077E-02	8.872E-01	1.038E+09
	14 884.730	166 185.470	1.379E+00	6	4	4.077E-02	5.323E-01	9.339E+08
	14 852.940	166 185.470	1.379E+00	4	4	6.797E-03	5.914E-02	1.038E+08
	14 852.940	166 151.610	1.379E+00	4	2	3.398E-02	2.957E-01	1.038E+09

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^2D^o \rightarrow h^2P^e$	1.5852	0.2017	1.383E+00	10	6	9.519E-03	2.064E-01	2.439E+08
	14 884.730	166 862.710	1.385E+00	6	4	9.530E-03	1.239E-01	2.202E+08
	14 852.940	166 862.710	1.385E+00	4	4	1.589E-03	1.376E-02	2.449E+07
	14 852.940	166 331.190	1.380E+00	4	2	7.915E-03	6.881E-02	2.423E+08
$z^2D^o \rightarrow i^2P^e$	1.5852	0.1765	1.409E+00	10	6	1.789E-02	3.810E-01	4.753E+08
	14 884.730	169 340.390	1.407E+00	6	4	1.788E-02	2.286E-01	4.266E+08
	14 852.940	169 340.390	1.408E+00	4	4	2.980E-03	2.540E-02	4.743E+07
	14 852.940	169 687.520	1.411E+00	4	2	1.493E-02	1.270E-01	4.776E+08
$z^2D^o \rightarrow j^2P^e$	1.5852	0.1342	1.451E+00	10	6	3.134E-03	6.480E-02	8.833E+07
	14 884.730	174 274.520	1.452E+00	6	4	3.137E-03	3.888E-02	7.974E+07
	14 852.940	174 274.520	1.453E+00	4	4	5.230E-04	4.320E-03	8.865E+06
	14 852.940	173 749.010	1.448E+00	4	2	2.606E-03	2.160E-02	8.778E+07
$z^2D^o \rightarrow a^2D^e$	1.5852	0.8285	7.567E-01	10	10	1.555E-02	6.166E-01	7.153E+07
	14 884.730	97 918.860	7.567E-01	6	6	1.452E-02	3.453E-01	6.675E+07
	14 884.730	97 890.740	7.564E-01	6	4	1.036E-03	2.467E-02	7.145E+06
	14 852.940	97 918.860	7.569E-01	4	6	1.556E-03	2.467E-02	4.774E+06
$z^2D^o \rightarrow b^2D^e$	1.5852	0.6132	9.719E-01	10	10	1.457E-01	4.497E+00	1.105E+09
	14 884.730	121 530.020	9.719E-01	6	6	1.360E-01	2.518E+00	1.032E+09
	14 884.730	121 528.720	9.719E-01	6	4	9.712E-03	1.799E-01	1.105E+08
	14 852.940	121 530.020	9.722E-01	4	6	1.457E-02	1.799E-01	7.375E+07
$z^2D^o \rightarrow c^2D^e$	1.5852	0.5029	1.082E+00	10	10	1.369E-01	3.794E+00	1.288E+09
	14 884.730	133 814.840	1.084E+00	6	6	1.279E-01	2.125E+00	1.207E+09
	14 884.730	133 360.860	1.080E+00	6	4	9.103E-03	1.518E-01	1.278E+08
	14 852.940	133 814.840	1.084E+00	4	6	1.371E-02	1.518E-01	8.627E+07
$z^2D^o \rightarrow d^2D^e$	1.5852	0.4079	1.177E+00	10	10	4.415E-01	1.125E+01	4.915E+09
	14 884.730	144 009.420	1.177E+00	6	6	4.118E-01	6.300E+00	4.580E+09
	14 884.730	144 142.160	1.178E+00	6	4	2.945E-02	4.500E-01	4.922E+08
	14 852.940	144 009.420	1.177E+00	4	6	4.413E-02	4.500E-01	3.274E+08
$z^2D^o \rightarrow e^2D^e$	1.5852	0.3639	1.221E+00	10	10	3.976E-01	4.050E+00	4.433E+09
	14 884.730	148 886.570	1.221E+00	6	6	9.436E-02	1.391E+00	1.130E+09
	14 884.730	148 900.910	1.221E+00	6	4	6.741E-03	9.935E-02	1.211E+08
	14 852.940	148 886.570	1.221E+00	4	6	1.011E-02	9.935E-02	8.079E+07
$z^2D^o \rightarrow f^2D^e$	1.5852	0.2673	1.318E+00	10	10	9.102E-02	8.942E-01	1.091E+09
	14 884.730	159 492.830	1.318E+00	6	6	2.069E-02	4.709E-01	2.886E+08
	14 884.730	159 495.940	1.318E+00	6	4	1.930E-02	2.637E-01	2.693E+08
	14 852.940	159 492.830	1.318E+00	4	6	1.379E-03	1.883E-02	2.885E+07
$z^2D^o \rightarrow g^2D^e$	1.5852	0.2469	1.338E+00	10	10	2.069E-03	1.883E-02	1.925E+07
	14 884.730	161 733.100	1.318E+00	4	4	1.862E-02	1.695E-01	2.598E+08
	14 884.730	161 737.990	1.338E+00	6	6	2.578E-02	3.468E-01	3.708E+08
	14 852.940	161 733.100	1.338E+00	6	4	1.842E-03	2.477E-02	3.974E+07
$z^2D^o \rightarrow h^2D^e$	1.5852	0.1944	1.391E+00	10	10	2.763E-03	2.477E-02	2.651E+07
	14 884.730	167 506.390	1.339E+00	4	4	2.487E-02	2.230E-01	3.579E+08
	14 884.730	167 472.420	1.391E+00	6	6	2.578E-02	3.468E-01	3.708E+08
	14 852.940	167 506.390	1.391E+00	6	4	1.151E-02	1.490E-01	2.682E+08
$z^2D^o \rightarrow i^2D^e$	1.5852	0.1944	1.391E+00	10	10	1.727E-01	3.726E+00	2.684E+09
	14 884.730	167 506.390	1.391E+00	6	6	1.612E-01	2.086E+00	2.505E+09
	14 884.730	167 472.420	1.390E+00	6	4	1.151E-02	1.490E-01	2.682E+08
	14 852.940	167 506.390	1.391E+00	4	6	1.728E-02	1.490E-01	1.790E+08
$z^2D^o \rightarrow j^2D^e$	1.5852	0.1944	1.391E+00	10	10	1.727E-01	3.726E+00	2.684E+09
	14 884.730	167 506.390	1.391E+00	6	6	1.612E-01	2.086E+00	2.505E+09
	14 884.730	167 472.420	1.390E+00	6	4	1.151E-02	1.490E-01	2.682E+08
	14 852.940	167 506.390	1.391E+00	4	6	1.728E-02	1.490E-01	1.790E+08

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$z^2D^o \rightarrow i^2D^o$	1.5852	0.1717	1.413E+00	10	10	5.552E-05	1.179E-03	8.910E+05
	14 884.730	170 015.230	1.414E+00	6	6	5.183E-05	6.600E-04	8.320E+05
	14 884.730	169 922.270	1.413E+00	6	4	3.700E-06	4.714E-05	8.897E+04
	14 852.940	170 015.230	1.414E+00	4	6	5.555E-06	4.714E-05	5.946E+04
	14 852.940	169 922.270	1.413E+00	4	4	4.996E-05	4.243E-04	8.012E+05
$z^2D^o \rightarrow j^2D^o$	1.5852	0.1071	1.478E+00	10	10	8.933E-03	1.813E-01	1.568E+08
	14 884.730	177 076.280	1.478E+00	6	6	8.336E-03	1.015E-01	1.463E+08
	14 884.730	177 077.020	1.478E+00	6	4	5.955E-04	7.252E-03	1.567E+07
	14 852.940	177 076.280	1.478E+00	4	6	8.934E-04	7.252E-03	1.045E+07
	14 852.940	177 077.020	1.478E+00	4	4	8.040E-03	6.527E-02	1.411E+08
$z^2D^o \rightarrow k^2D^o$	1.5852	0.0381	1.547E+00	10	10	9.396E-04	1.822E-02	1.806E+07
	14 884.730	184 642.760	1.547E+00	6	6	8.769E-04	1.020E-02	1.685E+07
	14 884.730	184 642.760	1.547E+00	6	4	6.263E-05	7.288E-04	1.806E+06
	14 852.940	184 642.760	1.547E+00	4	6	9.397E-05	7.288E-04	1.205E+06
	14 852.940	184 642.760	1.547E+00	4	4	8.457E-04	6.559E-03	1.626E+07
$z^2D^o \rightarrow a^2F^o$	1.5852	0.6720	9.132E-01	10	14	1.163E-02	3.821E-01	5.564E+07
	14 884.730	115 285.610	9.150E-01	6	8	1.110E-02	2.183E-01	5.597E+07
	14 884.730	114 804.370	9.106E-01	6	6	5.522E-04	1.092E-02	3.678E+06
	14 852.940	114 804.370	9.109E-01	4	6	1.160E-02	1.528E-01	5.153E+07
$z^2D^o \rightarrow b^2F^o$	1.5852	0.4584	1.127E+00	10	14	9.765E-01	2.600E+01	7.113E+09
	14 884.730	138 527.980	1.127E+00	6	8	9.300E-01	1.486E+01	7.113E+09
	14 884.730	138 509.170	1.127E+00	6	6	4.649E-02	7.428E-01	4.739E+08
	14 852.940	138 509.170	1.127E+00	4	6	9.766E-01	1.040E+01	6.640E+09
$z^2D^o \rightarrow c^2F^o$	1.5852	0.2955	1.290E+00	10	14	1.956E-01	4.550E+00	1.867E+09
	14 884.730	156 604.170	1.291E+00	6	8	1.865E-01	2.600E+00	1.874E+09
	14 884.730	156 121.700	1.287E+00	6	6	9.295E-03	1.300E-01	1.237E+08
	14 852.940	156 121.700	1.287E+00	4	6	1.952E-01	1.820E+00	1.733E+09
$z^2D^o \rightarrow d^2F^o$	1.5852	0.2236	1.362E+00	10	14	8.613E-02	1.898E+00	9.162E+08
	14 884.730	164 337.610	1.362E+00	6	8	8.205E-02	1.084E+00	9.169E+08
	14 884.730	164 232.360	1.361E+00	6	6	4.099E-03	5.422E-02	6.099E+07
	14 852.940	164 232.360	1.361E+00	4	6	8.611E-02	7.591E-01	8.544E+08
$z^2D^o \rightarrow e^2F^o$	1.5852	0.1759	1.409E+00	10	14	1.529E-01	3.255E+00	1.742E+09
	14 884.730	169 702.320	1.411E+00	6	8	1.458E-01	1.860E+00	1.748E+09
	14 884.730	169 283.540	1.407E+00	6	6	7.270E-03	9.301E-02	1.156E+08
	14 852.940	169 283.540	1.407E+00	4	6	1.527E-01	1.302E+00	1.619E+09
$y^2D^o \rightarrow c^2P^o$	0.5272	0.4453	8.193E-02	10	6	5.091E-04	1.864E-01	4.575E+04
	131 187.190	140 016.770	8.040E-02	6	4	4.996E-04	1.119E-01	3.891E+04
	130 641.110	140 016.770	8.540E-02	4	4	8.845E-05	1.243E-02	5.181E+03
	130 641.110	139 844.990	8.390E-02	4	2	4.345E-04	6.214E-02	4.913E+04
$y^2D^o \rightarrow d^2P^o$	0.5272	0.3936	1.336E-01	10	6	4.535E-04	1.018E-01	1.084E+05
	131 187.190	145 505.740	1.304E-01	6	4	4.426E-04	6.110E-02	9.068E+04
	130 641.110	145 505.740	1.354E-01	4	4	7.660E-05	6.789E-03	1.128E+04
	130 641.110	145 877.660	1.388E-01	4	2	3.926E-04	3.394E-02	1.215E+05
$y^2D^o \rightarrow e^2P^o$	0.5272	0.3380	1.892E-01	10	6	2.160E-01	3.424E+01	1.035E+08
	131 187.190	151 910.830	1.888E-01	6	4	2.155E-01	2.054E+01	9.254E+07
	130 641.110	151 910.830	1.938E-01	4	4	3.686E-02	2.283E+00	1.112E+07
	130 641.110	151 383.810	1.890E-01	4	2	1.798E-01	1.141E+01	1.032E+08
$y^2D^o \rightarrow f^2P^o$	0.5272	0.2720	2.553E-01	10	6	5.010E-04	5.888E-02	4.370E+05
	131 187.190	158 828.310	2.519E-01	6	4	4.944E-04	3.533E-02	3.780E+05
	130 641.110	158 828.310	2.569E-01	4	4	8.404E-05	3.926E-03	4.455E+04
	130 641.110	159 283.660	2.610E-01	4	2	4.269E-04	1.963E-02	4.672E+05

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$\theta_i$	$\theta_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^2D^* \rightarrow g^2P^*$	0.5272	0.2064	3.208E-01	10	6	5.045E-03	4.717E-01	6.950E+06
	131 187.190	166 185.470	3.189E-01	6	4	5.014E-03	2.830E-01	6.144E+06
	130 641.110	166 185.470	3.239E-01	4	4	8.488E-04	3.145E-02	7.153E+05
	130 641.110	166 151.610	3.236E-01	4	2	4.240E-03	1.572E-01	7.133E+06
$y^2D^* \rightarrow h^2P^*$	0.5272	0.2017	3.255E-01	10	6	2.370E-02	2.184E+00	3.361E+07
	131 187.190	166 862.710	3.251E-01	6	4	2.367E-02	1.311E+00	3.014E+07
	130 641.110	166 862.710	3.301E-01	4	4	4.006E-03	1.456E-01	3.506E+06
	130 641.110	166 331.190	3.252E-01	4	2	1.973E-02	7.281E-01	3.352E+07
$y^2D^* \rightarrow i^2P^*$	0.5272	0.1765	3.507E-01	10	6	9.549E-04	8.168E-02	1.572E+06
	131 187.190	169 340.390	3.476E-01	6	4	9.464E-04	4.901E-02	1.378E+06
	130 641.110	169 340.390	3.526E-01	4	4	1.600E-04	5.445E-03	1.598E+05
	130 641.110	169 687.520	3.558E-01	4	2	8.073E-04	2.723E-02	1.642E+06
$y^2D^* \rightarrow j^2P^*$	0.5272	0.1342	3.930E-01	10	6	8.688E-03	6.631E-01	1.797E+07
	131 187.190	174 274.520	3.926E-01	6	4	8.678E-03	3.979E-01	1.612E+07
	130 641.110	174 274.520	3.976E-01	4	4	1.465E-03	4.421E-02	1.860E+06
	130 641.110	173 749.010	3.928E-01	4	2	7.236E-03	2.210E-01	1.793E+07
$y^2D^* \rightarrow c^2D^*$	0.5272	0.5029	2.428E-02	10	10	8.964E-03	1.108E+01	4.245E+04
	131 187.190	133 814.840	2.390E-02	6	6	8.235E-03	6.202E+00	3.778E+04
	131 187.190	133 360.860	1.980E-02	6	4	4.873E-04	4.430E-01	2.302E+03
	130 641.110	133 814.840	2.890E-02	4	6	1.067E-03	4.430E-01	4.772E+03
	130 641.110	133 360.860	2.480E-02	4	4	8.240E-03	3.987E+00	4.071E+04
$y^2D^* \rightarrow d^2D^*$	0.5272	0.4079	1.193E-01	10	10	4.673E-04	1.175E-01	5.344E+04
	131 187.190	144 009.420	1.168E-01	6	6	4.269E-04	6.579E-02	4.678E+04
	131 187.190	144 142.160	1.180E-01	6	4	3.081E-05	4.699E-03	5.168E+03
	130 641.110	144 009.420	1.218E-01	4	6	4.770E-05	4.699E-03	3.789E+03
	130 641.110	144 142.160	1.230E-01	4	4	4.335E-04	4.229E-02	5.268E+04
$y^2D^* \rightarrow e^2D^*$	0.5272	0.3639	1.633E-01	10	10	5.853E-02	1.075E+01	1.254E+07
	131 187.190	148 886.570	1.613E-01	6	6	5.395E-02	6.020E+00	1.127E+07
	131 187.190	148 900.910	1.614E-01	6	4	3.856E-03	4.300E-01	1.210E+06
	130 641.110	148 886.570	1.663E-01	4	6	5.959E-03	4.300E-01	8.825E+05
	130 641.110	148 900.910	1.664E-01	4	4	5.366E-02	3.870E+00	1.194E+07
$y^2D^* \rightarrow f^2D^*$	0.5272	0.2673	2.599E-01	10	10	2.724E-02	3.144E+00	1.479E+07
	131 187.190	159 492.830	2.579E-01	6	6	2.523E-02	1.761E+00	1.348E+07
	131 187.190	159 495.940	2.579E-01	6	4	1.802E-03	1.258E-01	1.444E+06
	130 641.110	159 492.830	2.629E-01	4	6	2.755E-03	1.258E-01	1.020E+06
	130 641.110	159 495.940	2.629E-01	4	4	2.480E-02	1.132E+00	1.377E+07
$y^2D^* \rightarrow g^2D^*$	0.5272	0.2469	2.804E-01	10	10	1.454E-02	1.556E+00	9.179E+06
	131 187.190	161 733.100	2.783E-01	6	6	1.347E-02	8.712E-01	8.379E+06
	131 187.190	161 737.990	2.784E-01	6	4	9.624E-04	6.223E-02	8.987E+05
	130 641.110	161 733.100	2.833E-01	4	6	1.469E-03	6.223E-02	6.314E+05
	130 641.110	161 737.990	2.834E-01	4	4	1.323E-02	5.600E-01	8.532E+06
$y^2D^* \rightarrow h^2D^*$	0.5272	0.1944	3.328E-01	10	10	5.236E-03	4.720E-01	4.659E+06
	131 187.190	167 506.390	3.309E-01	6	6	4.859E-03	2.643E-01	4.273E+06
	131 187.190	167 472.420	3.306E-01	6	4	3.467E-04	1.888E-02	4.566E+05
	130 641.110	167 506.390	3.359E-01	4	6	5.284E-04	1.888E-02	3.193E+05
	130 641.110	167 472.420	3.356E-01	4	4	4.752E-03	1.699E-01	4.299E+06
$y^2D^* \rightarrow i^2D^*$	0.5272	0.1717	3.555E-01	10	10	2.077E-02	1.753E+00	2.109E+07
	131 187.190	170 015.230	3.538E-01	6	6	1.930E-02	9.818E-01	1.940E+07
	131 187.190	169 922.270	3.529E-01	6	4	1.375E-03	7.013E-02	2.063E+06
	130 641.110	170 015.230	3.588E-01	4	6	2.097E-03	7.013E-02	1.445E+06
	130 641.110	169 922.270	3.579E-01	4	4	1.882E-02	6.311E-01	1.937E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$y^2D^\circ \rightarrow j^2D^\circ$	0.5272	0.1071	4.202E-01	10	10	2.607E-03	1.861E-01	3.696E+06
	131 187.190	177 076.280	4.181E-01	6	6	2.421E-03	1.042E-01	3.399E+06
	131 187.190	177 077.020	4.181E-01	6	4	1.729E-04	7.444E-03	3.642E+05
	130 641.110	177 076.280	4.231E-01	4	6	2.625E-04	7.444E-03	2.516E+05
	130 641.110	177 077.020	4.231E-01	4	4	2.362E-03	6.700E-02	3.397E+06
$y^2D^\circ \rightarrow k^2D^\circ$	0.5272	0.0381	4.891E-01	10	10	8.981E-04	5.508E-02	1.726E+06
	131 187.190	184 642.760	4.871E-01	6	6	8.348E-04	3.085E-02	1.591E+06
	131 187.190	184 642.760	4.871E-01	6	4	5.963E-05	2.203E-03	1.704E+05
	130 641.110	184 642.760	4.921E-01	4	6	9.036E-05	2.203E-03	1.172E+05
	130 641.110	184 642.760	4.921E-01	4	4	8.132E-04	1.983E-02	1.582E+06
$y^2D^\circ \rightarrow b^2F^\circ$	0.5272	0.4584	6.881E-02	10	14	1.116E-01	4.864E+01	3.031E+06
	131 187.190	138 527.980	6.690E-02	6	8	1.033E-01	2.779E+01	2.785E+06
	131 187.190	138 509.170	6.670E-02	6	6	5.149E-03	1.390E+00	1.840E+05
	130 641.110	138 509.170	7.170E-02	4	6	1.162E-01	1.946E+01	3.200E+06
$y^2D^\circ \rightarrow c^2F^\circ$	0.5272	0.2955	2.317E-01	10	14	6.195E-01	8.021E+01	1.909E+08
	131 187.190	156 604.170	2.316E-01	6	8	5.897E-01	4.583E+01	1.906E+08
	131 187.190	156 121.700	2.272E-01	6	6	2.893E-02	2.292E+00	1.199E+07
	130 641.110	156 121.700	2.322E-01	4	6	6.208E-01	3.208E+01	1.792E+08
$y^2D^\circ \rightarrow d^2F^\circ$	0.5272	0.2236	3.037E-01	10	14	2.187E-02	2.161E+00	1.157E+07
	131 187.190	164 337.610	3.021E-01	6	8	2.072E-02	1.235E+00	1.139E+07
	131 187.190	164 232.360	3.011E-01	6	6	1.033E-03	6.173E-02	7.520E+05
	130 641.110	164 232.360	3.061E-01	4	6	2.205E-02	8.643E-01	1.106E+07
$y^2D^\circ \rightarrow e^2F^\circ$	0.5272	0.1759	3.513E-01	10	14	5.681E-02	4.851E+00	4.023E+07
	131 187.190	169 702.320	3.509E-01	6	8	5.404E-02	2.772E+00	4.009E+07
	131 187.190	169 283.540	3.471E-01	6	6	2.673E-03	1.386E-01	2.586E+06
	130 641.110	169 283.540	3.521E-01	4	6	5.694E-02	1.940E+00	3.780E+07
$x^2D^\circ \rightarrow d^2P^\circ$	0.4383	0.3936	4.469E-02	10	6	8.509E-04	5.712E-01	2.275E+04
	140 708.890	145 505.740	4.370E-02	6	4	8.320E-04	3.427E-01	1.914E+04
	140 750.340	145 505.740	4.330E-02	4	4	1.374E-04	3.808E-02	2.069E+03
	140 750.340	145 877.660	4.670E-02	4	2	7.409E-04	1.904E-01	2.596E+04
$x^2D^\circ \rightarrow e^2P^\circ$	0.4383	0.3380	1.003E-01	10	6	4.431E-02	1.325E+01	5.970E+06
	140 708.890	151 910.830	1.021E-01	6	4	4.509E-02	7.949E+00	5.663E+06
	140 750.340	151 910.830	1.017E-01	4	4	7.486E-03	8.833E-01	6.219E+05
	140 750.340	151 383.810	9.690E-02	4	2	3.566E-02	4.416E+00	5.379E+06
$x^2D^\circ \rightarrow f^2P^\circ$	0.4383	0.2720	1.663E-01	10	6	2.952E-03	5.324E-01	1.094E+06
	140 708.890	158 828.310	1.652E-01	6	4	2.932E-03	3.195E-01	9.640E+05
	140 750.340	158 828.310	1.648E-01	4	4	4.875E-04	3.549E-02	1.063E+05
	140 750.340	159 283.660	1.689E-01	4	2	2.498E-03	1.775E-01	1.145E+06
$x^2D^\circ \rightarrow g^2P^\circ$	0.4383	0.2064	2.319E-01	10	6	3.155E-02	4.081E+00	2.271E+07
	140 708.890	166 185.470	2.322E-01	6	4	3.159E-02	2.449E+00	2.052E+07
	140 750.340	166 185.470	2.318E-01	4	4	5.256E-03	2.721E-01	2.268E+06
	140 750.340	166 151.610	2.315E-01	4	2	2.625E-02	1.360E+00	2.260E+07
$x^2D^\circ \rightarrow h^2P^\circ$	0.4383	0.2017	2.366E-01	10	6	1.970E-02	2.498E+00	1.476E+07
	140 708.890	166 862.710	2.384E-01	6	4	1.985E-02	1.499E+00	1.359E+07
	140 750.340	166 862.710	2.380E-01	4	4	3.303E-03	1.665E-01	1.503E+06
	140 750.340	166 331.190	2.331E-01	4	2	1.617E-02	8.326E-01	1.412E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$x^2D^\circ \rightarrow i^2P^\circ$	0.4383	0.1765	2.618E-01	10	6	3.946E-03	4.522E-01	3.621E+06
	140 708.890	169 340.390	2.609E-01	6	4	3.933E-03	2.713E-01	3.225E+06
	140 750.340	169 340.390	2.605E-01	4	4	6.544E-04	3.015E-02	3.567E+05
	140 750.340	169 687.520	2.637E-01	4	2	3.312E-03	1.507E-01	3.700E+06
$x^2D^\circ \rightarrow j^2P^\circ$	0.4383	0.1342	3.041E-01	10	6	2.759E-04	2.722E-02	3.416E+05
	140 708.890	174 274.520	3.059E-01	6	4	2.775E-04	1.633E-02	3.129E+05
	140 750.340	174 274.520	3.055E-01	4	4	4.619E-05	1.814E-03	3.463E+04
	140 750.340	173 749.010	3.007E-01	4	2	2.273E-04	9.072E-03	3.302E+05
$x^2D^\circ \rightarrow d^2D^\circ$	0.4383	0.4079	3.041E-02	10	10	2.462E-02	2.429E+01	1.829E+05
	140 708.890	144 009.420	3.010E-02	6	6	2.275E-02	1.360E+01	1.655E+05
	140 708.890	144 142.160	3.130E-02	6	4	1.690E-03	9.717E-01	1.994E+04
	140 750.340	144 009.420	2.970E-02	4	6	2.405E-03	9.717E-01	1.136E+04
	140 750.340	144 142.160	3.090E-02	4	4	2.252E-02	8.745E+00	1.727E+05
$x^2D^\circ \rightarrow e^2D^\circ$	0.4383	0.3639	7.442E-02	10	10	4.783E-03	1.928E+00	2.128E+05
	140 708.890	148 886.570	7.460E-02	6	6	4.475E-03	1.080E+00	2.000E+05
	140 708.890	148 900.910	7.470E-02	6	4	3.201E-04	7.713E-02	2.152E+04
	140 750.340	148 886.570	7.420E-02	4	6	4.769E-04	7.713E-02	1.406E+04
	140 750.340	148 900.910	7.430E-02	4	4	4.298E-03	6.941E-01	1.906E+05
$x^2D^\circ \rightarrow f^2D^\circ$	0.4383	0.2673	1.710E-01	10	10	2.871E-02	5.035E+00	6.745E+06
	140 708.890	159 492.830	1.712E-01	6	6	2.682E-02	2.820E+00	6.314E+06
	140 708.890	159 495.940	1.712E-01	6	4	1.916E-03	2.014E-01	6.765E+05
	140 750.340	159 492.830	1.708E-01	4	6	2.867E-03	2.014E-01	4.478E+05
	140 750.340	159 495.940	1.708E-01	4	4	2.580E-02	1.813E+00	6.046E+06
$x^2D^\circ \rightarrow g^2D^\circ$	0.4383	0.2469	1.915E-01	10	10	2.646E-01	4.146E+01	7.791E+07
	140 708.890	161 733.100	1.916E-01	6	6	2.472E-01	2.322E+01	7.288E+07
	140 708.890	161 737.990	1.917E-01	6	4	1.766E-02	1.659E+00	7.821E+06
	140 750.340	161 733.100	1.912E-01	4	6	2.643E-02	1.659E+00	5.173E+06
	140 750.340	161 737.990	1.913E-01	4	4	2.380E-01	1.493E+01	6.995E+07
$x^2D^\circ \rightarrow h^2D^\circ$	0.4383	0.1944	2.439E-01	10	10	1.652E-01	2.031E+01	7.893E+07
	140 708.890	167 506.390	2.442E-01	6	6	1.543E-01	1.137E+01	7.392E+07
	140 708.890	167 472.420	2.439E-01	6	4	1.101E-02	8.125E-01	7.890E+06
	140 750.340	167 506.390	2.438E-01	4	6	1.651E-02	8.125E-01	5.254E+06
	140 750.340	167 472.420	2.435E-01	4	4	1.484E-01	7.312E+00	7.067E+07
$x^2D^\circ \rightarrow i^2D^\circ$	0.4383	0.1717	2.666E-01	10	10	3.177E-03	3.575E-01	1.813E+06
	140 708.890	170 015.230	2.671E-01	6	6	2.971E-03	2.002E-01	1.702E+06
	140 708.890	169 922.270	2.662E-01	6	4	2.115E-04	1.430E-02	1.806E+05
	140 750.340	170 015.230	2.667E-01	4	6	3.178E-04	1.430E-02	1.211E+05
	140 750.340	169 922.270	2.658E-01	4	4	2.851E-03	1.287E-01	1.618E+06
$x^2D^\circ \rightarrow j^2D^\circ$	0.4383	0.1071	3.313E-01	10	10	2.574E-02	2.331E+00	2.269E+07
	140 708.890	177 076.280	3.314E-01	6	6	2.403E-02	1.305E+00	2.120E+07
	140 708.890	177 077.020	3.314E-01	6	4	1.717E-03	9.325E-02	2.272E+06
	140 750.340	177 076.280	3.310E-01	4	6	2.572E-03	9.325E-02	1.509E+06
	140 750.340	177 077.020	3.310E-01	4	4	2.315E-02	8.392E-01	2.037E+07
$x^2D^\circ \rightarrow k^2D^\circ$	0.4383	0.0381	4.002E-01	10	10	7.928E-05	5.943E-03	1.020E+05
	140 708.890	184 642.760	4.004E-01	6	6	7.403E-05	3.328E-03	9.533E+04
	140 708.890	184 642.760	4.004E-01	6	4	5.288E-06	2.377E-04	1.021E+04
	140 750.340	184 642.760	4.000E-01	4	6	7.924E-06	2.377E-04	6.789E+03
	140 750.340	184 642.760	4.000E-01	4	4	7.131E-05	2.139E-03	9.165E+04



Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$x^2D^\circ \rightarrow c^2F^\circ$	0.4383	0.2955	1.428E-01	10	14	5.319E-04	1.117E-01	6.224E+04
	140 708.890	156 604.170	1.449E-01	6	8	5.140E-04	6.385E-02	6.501E+04
	140 708.890	156 121.700	1.405E-01	6	6	2.492E-05	3.192E-03	3.951E+03
	140 750.340	156 121.700	1.401E-01	4	6	5.218E-04	4.469E-02	5.484E+04
$x^2D^\circ \rightarrow d^2F^\circ$	0.4383	0.2236	2.148E-01	10	14	4.520E-01	6.314E+01	1.196E+08
	140 708.890	164 337.610	2.154E-01	6	8	4.318E-01	3.608E+01	1.207E+08
	140 708.890	164 232.360	2.144E-01	6	6	2.149E-02	1.804E+00	7.934E+06
	140 750.340	164 232.360	2.140E-01	4	6	4.504E-01	2.526E+01	1.105E+08
$x^2D^\circ \rightarrow e^2F^\circ$	0.4383	0.1759	2.624E-01	10	14	8.317E-02	9.508E+00	3.286E+07
	140 708.890	169 702.320	2.642E-01	6	8	7.975E-02	5.433E+00	3.353E+07
	140 708.890	169 283.540	2.604E-01	6	6	3.930E-03	2.717E-01	2.141E+06
	140 750.340	169 283.540	2.600E-01	4	6	8.240E-02	3.803E+00	2.983E+07
$w^2D^\circ \rightarrow f^2P^\circ$	0.2762	0.2720	4.234E-03	10	6	5.873E-04	4.162E+00	1.409E+02
	158 715.460	158 828.310	1.100E-03	6	4	1.526E-04	2.497E+00	2.225E+00
	158 215.590	158 828.310	5.600E-03	4	4	1.295E-04	2.775E-01	3.261E+01
	158 215.590	159 283.660	9.700E-03	4	2	1.121E-03	1.387E+00	1.695E+03
$w^2D^\circ \rightarrow g^2P^\circ$	0.2762	0.2064	6.979E-02	10	6	1.878E-01	8.074E+01	1.225E+07
	158 715.460	166 185.470	6.810E-02	6	4	1.833E-01	4.844E+01	1.024E+07
	158 215.590	166 185.470	7.260E-02	4	4	3.256E-02	5.383E+00	1.379E+06
	158 215.590	166 151.610	7.230E-02	4	2	1.621E-01	2.691E+01	1.362E+07
$w^2D^\circ \rightarrow h^2P^\circ$	0.2762	0.2017	7.445E-02	10	6	1.411E-01	5.687E+01	1.047E+07
	158 715.460	166 862.710	7.430E-02	6	4	1.408E-01	3.412E+01	9.368E+06
	158 215.590	166 862.710	7.880E-02	4	4	2.490E-02	3.791E+00	1.242E+06
	158 215.590	166 331.190	7.390E-02	4	2	1.167E-01	1.896E+01	1.024E+07
$w^2D^\circ \rightarrow i^2P^\circ$	0.2762	0.1765	9.970E-02	10	6	1.476E-04	4.442E-02	1.964E+04
	158 715.460	169 340.390	9.680E-02	6	4	1.433E-04	2.665E-02	1.618E+04
	158 215.590	169 340.390	1.013E-01	4	4	2.500E-05	2.962E-03	2.061E+03
	158 215.590	169 687.520	1.045E-01	4	2	1.290E-04	1.481E-02	2.262E+04
$w^2D^\circ \rightarrow j^2P^\circ$	0.2762	0.1342	1.420E-01	10	6	3.946E-02	8.336E+00	1.065E+07
	158 715.460	174 274.520	1.418E-01	6	4	3.940E-02	5.001E+00	9.545E+06
	158 215.590	174 274.520	1.463E-01	4	4	6.775E-03	5.557E-01	1.165E+06
	158 215.590	173 749.010	1.415E-01	4	2	3.276E-02	2.779E+00	1.054E+07
$w^2D^\circ \rightarrow i^2D^\circ$	0.2762	0.2673	8.917E-03	10	10	2.494E-02	8.391E+01	1.593E+04
	158 715.460	159 492.830	7.100E-03	6	6	1.854E-02	4.699E+01	7.505E+03
	158 715.460	159 495.940	7.100E-03	6	4	1.324E-03	3.357E+00	8.041E+02
	158 215.590	159 492.830	1.160E-02	4	6	3.245E-03	3.357E+00	2.338E+03
	158 215.590	159 495.940	1.160E-02	4	4	2.920E-02	3.021E+01	3.156E+04
$w^2D^\circ \rightarrow g^2D^\circ$	0.2762	0.2469	2.934E-02	10	10	3.468E-03	3.546E+00	2.398E+04
	158 715.460	161 733.100	2.750E-02	6	6	3.034E-03	1.986E+00	1.843E+04
	158 715.460	161 737.990	2.760E-02	6	4	2.175E-04	1.419E-01	1.996E+03
	158 215.590	161 733.100	3.200E-02	4	6	3.783E-04	1.419E-01	2.074E+03
	158 215.590	161 737.990	3.210E-02	4	4	3.415E-03	1.277E+00	2.827E+04
$w^2D^\circ \rightarrow h^2D^\circ$	0.2762	0.1944	8.181E-02	10	10	3.882E-02	1.424E+01	2.087E+06
	158 715.460	167 506.390	8.010E-02	6	6	3.548E-02	7.972E+00	1.828E+06
	158 715.460	167 472.420	7.980E-02	6	4	2.524E-03	5.694E-01	1.937E+05
	158 215.590	167 506.390	8.460E-02	4	6	4.014E-03	5.694E-01	1.539E+05
	158 215.590	167 472.420	8.430E-02	4	4	3.600E-02	5.125E+00	2.055E+06

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{fi}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{fi}$ $\text{s}^{-1}$
$w^2D^\circ \rightarrow i^2D^\circ$	0.2762	0.1717	1.045E-01	10	10	5.670E-02	1.628E+01	4.969E+06
	158 715.460	170 015.230	1.030E-01	6	6	5.218E-02	9.120E+00	4.447E+06
	158 715.460	169 922.270	1.021E-01	6	4	3.695E-03	6.514E-01	4.641E+05
	158 215.590	170 015.230	1.075E-01	4	6	5.835E-03	6.514E-01	3.611E+05
	158 215.590	169 922.270	1.066E-01	4	4	5.208E-02	5.863E+00	4.754E+06
$w^2D^\circ \rightarrow j^2D^\circ$	0.2762	0.1071	1.691E-01	10	10	2.103E-04	3.730E-02	4.833E+04
	158 715.460	177 076.280	1.673E-01	6	6	1.941E-04	2.089E-02	4.365E+04
	158 715.460	177 077.020	1.673E-01	6	4	1.387E-05	1.492E-03	4.676E+03
	158 215.590	177 076.280	1.718E-01	4	6	2.136E-05	1.492E-03	3.376E+03
	158 215.590	177 077.020	1.718E-01	4	4	1.922E-04	1.343E-02	4.558E+04
$w^2D^\circ \rightarrow k^2D^\circ$	0.2762	0.0381	2.381E-01	10	10	1.794E-03	2.260E-01	8.167E+05
	158 715.460	184 642.760	2.363E-01	6	6	1.661E-03	1.266E-01	7.452E+05
	158 715.460	184 642.760	2.363E-01	6	4	1.187E-04	9.040E-03	7.984E+04
	158 215.590	184 642.760	2.408E-01	4	6	1.814E-04	9.040E-03	5.633E+04
	158 215.590	184 642.760	2.408E-01	4	4	1.633E-03	8.136E-02	7.604E+05
$w^2D^\circ \rightarrow d^2F^\circ$	0.2762	0.2236	5.264E-02	10	14	2.727E-01	1.554E+02	4.336E+06
	158 715.460	164 337.610	5.130E-02	6	8	2.531E-01	8.880E+01	4.012E+06
	158 715.460	164 232.360	5.030E-02	6	6	1.241E-02	4.440E+00	2.522E+05
	158 215.590	164 232.360	5.480E-02	4	6	2.839E-01	6.216E+01	4.565E+06
$w^2D^\circ \rightarrow e^2F^\circ$	0.2762	0.1759	1.003E-01	10	14	5.035E-01	1.506E+02	2.907E+07
	158 715.460	169 702.320	1.001E-01	6	8	4.786E-01	8.605E+01	2.889E+07
	158 715.460	169 283.540	9.630E-02	6	6	2.302E-02	4.303E+00	1.715E+06
	158 215.590	169 283.540	1.008E-01	4	6	5.060E-01	6.024E+01	2.753E+07
$z^2F^\circ \rightarrow d^2D^\circ$	0.4424	0.4079	3.446E-02	14	10	3.992E-03	4.865E+00	5.330E+04
	140 319.230	144 009.420	3.360E-02	8	6	3.892E-03	2.780E+00	4.706E+04
	140 230.100	144 009.420	3.440E-02	6	6	2.656E-04	1.390E-01	2.525E+03
	140 230.100	144 142.160	3.560E-02	6	4	3.849E-03	1.946E+00	5.877E+04
$z^2F^\circ \rightarrow e^2D^\circ$	0.4424	0.3639	7.847E-02	14	10	2.789E-03	1.493E+00	1.931E+05
	140 319.230	148 886.570	7.810E-02	8	6	2.776E-03	8.530E-01	1.813E+05
	140 230.100	148 886.570	7.890E-02	6	6	1.869E-04	4.265E-02	9.348E+03
	140 230.100	148 900.910	7.900E-02	6	4	2.621E-03	5.971E-01	1.970E+05
$z^2F^\circ \rightarrow f^2D^\circ$	0.4424	0.2673	1.751E-01	14	10	3.240E-03	7.773E-01	1.117E+06
	140 319.230	159 492.830	1.747E-01	8	6	3.233E-03	4.442E-01	1.057E+06
	140 230.100	159 492.830	1.755E-01	6	6	2.165E-04	2.221E-02	5.357E+04
	140 230.100	159 495.940	1.755E-01	6	4	3.032E-03	3.109E-01	1.125E+06
$z^2F^\circ \rightarrow g^2D^\circ$	0.4424	0.2469	1.955E-01	14	10	2.070E-01	4.447E+01	8.898E+07
	140 319.230	161 733.100	1.951E-01	8	6	2.066E-01	2.541E+01	8.422E+07
	140 230.100	161 733.100	1.959E-01	6	6	1.383E-02	1.271E+00	4.263E+06
	140 230.100	161 737.990	1.960E-01	6	4	1.937E-01	1.779E+01	8.966E+07
$z^2F^\circ \rightarrow h^2D^\circ$	0.4424	0.1944	2.480E-01	14	10	1.611E-02	2.728E+00	1.114E+07
	140 319.230	167 506.390	2.477E-01	8	6	1.609E-02	1.559E+00	1.057E+07
	140 230.100	167 506.390	2.485E-01	6	6	1.076E-03	7.795E-02	5.338E+05
	140 230.100	167 472.420	2.482E-01	6	4	1.505E-02	1.091E+00	1.117E+07
$z^2F^\circ \rightarrow i^2D^\circ$	0.4424	0.1717	2.706E-01	14	10	1.125E-03	1.745E-01	9.261E+05
	140 319.230	170 015.230	2.706E-01	8	6	1.124E-03	9.973E-02	8.818E+05
	140 230.100	170 015.230	2.714E-01	6	6	7.519E-05	4.987E-03	4.448E+04
	140 230.100	169 922.270	2.705E-01	6	4	1.049E-03	6.981E-02	9.249E+05
$z^2F^\circ \rightarrow j^2D^\circ$	0.4424	0.1071	3.353E-01	14	10	2.629E-02	3.293E+00	3.323E+07
	140 319.230	177 076.280	3.349E-01	8	6	2.625E-02	1.882E+00	3.154E+07
	140 230.100	177 076.280	3.357E-01	6	6	1.755E-03	9.408E-02	1.588E+06
	140 230.100	177 077.020	3.357E-01	6	4	2.456E-02	1.317E+00	3.335E+07

Table IV. *Continued*

Transition	$E_i$ $\text{cm}^{-1}$	$E_f$ $\text{cm}^{-1}$	$E_{f_i}$ Ry	$g_i$	$g_f$	$f_{if}$	$S$	$A_{f_i}$ $\text{s}^{-1}$
$z^2F^\circ \rightarrow k^2D^\circ$	0.4424	0.0381	4.043E-01	14	10	3.829E-06	3.978E-04	7.036E+03
	140 319.230	184 642.760	4.039E-01	8	6	3.825E-06	2.273E-04	6.684E+03
	140 230.100	184 642.760	4.047E-01	6	6	2.555E-07	1.137E-05	3.362E+02
	140 230.100	184 642.760	4.047E-01	6	4	3.578E-06	1.591E-04	7.060E+03
$z^2F^\circ \rightarrow c^2F^\circ$	0.4424	0.2955	1.469E-01	14	14	4.824E-02	1.380E+01	8.358E+06
	140 319.230	156 604.170	1.484E-01	8	8	4.701E-02	7.602E+00	8.315E+06
	140 319.230	156 121.700	1.440E-01	8	6	1.689E-03	2.816E-01	3.752E+05
	140 230.100	156 604.170	1.492E-01	6	8	2.334E-03	2.816E-01	3.130E+05
	140 230.100	156 121.700	1.448E-01	6	6	4.576E-02	5.688E+00	7.706E+06
$z^2F^\circ \rightarrow d^2F^\circ$	0.4424	0.2236	2.188E-01	14	14	1.446E-01	2.776E+01	5.562E+07
	140 319.230	164 337.610	2.189E-01	8	8	1.395E-01	1.530E+01	5.370E+07
	140 319.230	164 232.360	2.179E-01	8	6	5.144E-03	5.666E-01	2.616E+06
	140 230.100	164 337.610	2.197E-01	6	8	6.915E-03	5.666E-01	2.011E+06
	140 230.100	164 232.360	2.187E-01	6	6	1.391E-01	1.144E+01	5.342E+07
$z^2F^\circ \rightarrow e^2F^\circ$	0.4424	0.1759	2.665E-01	14	14	1.619E-02	2.551E+00	9.231E+06
	140 319.230	169 702.320	2.677E-01	8	8	1.568E-02	1.406E+00	9.025E+06
	140 319.230	169 283.540	2.639E-01	8	6	5.725E-04	5.206E-02	4.270E+05
	140 230.100	169 702.320	2.685E-01	6	8	7.766E-04	5.206E-02	3.373E+05
	140 230.100	169 283.540	2.647E-01	6	6	1.547E-02	1.052E+00	8.704E+06
$z^2F^\circ \rightarrow b^2G^\circ$	0.4424	0.2241	2.182E-01	14	18	7.934E-01	1.527E+02	2.361E+08
	140 319.230	164 268.790	2.182E-01	8	10	7.712E-01	8.483E+01	2.359E+08
	140 319.230	164 181.170	2.174E-01	8	8	2.195E-02	2.424E+00	8.334E+06
	140 230.100	164 181.170	2.182E-01	6	8	7.932E-01	6.544E+01	2.275E+08
$z^2F^\circ \rightarrow c^2G^\circ$	0.4424	0.0967	3.456E-01	14	18	7.745E-02	9.411E+00	5.780E+07
	140 319.230	178 240.640	3.455E-01	8	10	7.527E-02	5.228E+00	5.773E+07
	140 319.230	178 173.390	3.449E-01	8	8	2.147E-03	1.494E-01	2.051E+06
	140 230.100	178 173.390	3.457E-01	6	8	7.746E-02	4.033E+00	5.577E+07
$y^2F^\circ \rightarrow i^2D^\circ$	0.1856	0.1717	1.383E-02	14	10	1.725E-03	5.238E+00	3.709E+03
	168 473.480	170 015.230	1.410E-02	8	6	1.758E-03	2.993E+00	3.744E+03
	168 443.140	170 015.230	1.430E-02	6	6	1.189E-04	1.496E-01	1.953E+02
	168 443.140	169 922.270	1.340E-02	6	4	1.560E-03	2.095E+00	3.374E+03
$y^2F^\circ \rightarrow j^2D^\circ$	0.1856	0.1071	7.852E-02	14	10	3.007E-01	1.609E+02	2.085E+07
	168 473.480	177 076.280	7.840E-02	8	6	3.003E-01	9.193E+01	1.977E+07
	168 443.140	177 076.280	7.860E-02	6	6	2.007E-02	4.597E+00	9.960E+05
	168 443.140	177 077.020	7.860E-02	6	4	2.810E-01	6.435E+01	2.092E+07
$y^2F^\circ \rightarrow k^2D^\circ$	0.1856	0.0381	1.475E-01	14	10	2.997E-06	8.535E-04	7.328E+02
	168 473.480	184 642.760	1.474E-01	8	6	2.995E-06	4.877E-04	6.970E+02
	168 443.140	184 642.760	1.476E-01	6	6	2.000E-07	2.438E-05	3.499E+01
	168 443.140	184 642.760	1.476E-01	6	4	2.799E-06	3.414E-04	7.348E+02
$y^2F^\circ \rightarrow e^2F^\circ$	0.1856	0.1759	9.681E-03	14	14	6.398E-03	2.776E+01	4.817E+03
	168 473.480	169 702.320	1.120E-02	8	8	7.138E-03	1.530E+01	7.192E+03
	168 473.480	169 283.540	7.400E-03	8	6	1.747E-04	5.665E-01	1.024E+02
	168 443.140	169 702.320	1.140E-02	6	8	3.588E-04	5.665E-01	2.809E+02
	168 443.140	169 283.540	7.600E-03	6	6	4.832E-03	1.144E+01	2.242E+03
$y^2F^\circ \rightarrow c^2G^\circ$	0.1856	0.0967	8.885E-02	14	18	9.545E-01	4.512E+02	4.708E+07
	168 473.480	178 240.640	8.900E-02	8	10	9.296E-01	2.507E+02	4.731E+07
	168 473.480	178 173.390	8.840E-02	8	8	2.638E-02	7.162E+00	1.656E+06
	168 443.140	178 173.390	8.860E-02	6	8	9.518E-01	1.934E+02	4.501E+07